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New Zealand Journal of Agriculture

VOL. 69, No. 5. WELLINGTON, NOVEMBER 15, 1944

PUBLISHED BY DIRECTION OF
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THE NEW ZEALAND JOURNAL OF AGRICULTURE

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Published by direction of Hon. B. Roberts, Minister of Agriculture.

THE LINEN FLAX INDUSTRY

Recent publicity given to the production of linen flax in New Zealand has revealed a want of understanding, and I might add of sympathy, in the objectives, attainments, and difficulties associated with the industry. My Management Committee has therefore authorised me to make the following statement, in which I shall endeavour to state clearly the objectives, attainments, and future of this industry.—J. W. HADFIELD, Director of the Linen Flax Development, Christchurch.

1. OBJECTIVES.

Background

THE point of view generally expressed is that because there has been a financial loss in the undertaking and because some factories have already closed and others will have to close some time in the future, the industry has failed in its objectives. It would be as well in the first place to be quite clear as to what these objectives were in 1940, when production was first inaugurated. Only by clearing this issue can the other points raised be seen in their true perspective.

In 1940 the British Government asked New Zealand to grow and process 15,000 acres of flax, and early in 1941, even before the first harvest had been completed, asked that the area in 1941 should be increased to the uttermost limit. Since flax fibre is essential for the prosecution of the war, flax had to be produced regardless of consequences and as rapidly as possible. We did not hesitate at that time to consider whether the undertaking would be a financial success. On the contrary, there was a crisis to be met, and one of such urgency that financial results were relatively unimportant. Who can measure the cash value of a commodity essential for the prosecution of the war? Could we in 1940 have quibbled over the possibility of a financial loss and allow the personnel of our Army, Air Force, Navy, and Mercantile Marine to risk their lives ill-equipped when we, in this country, could do something towards assisting in their equipment? Such was the background which in 1940 determined New Zealand's participation in the flax industry. Therefore it seems illogical at this stage, when the crisis is passing, to regard the high cost of production as necessarily an indication of failure.

Financial Position

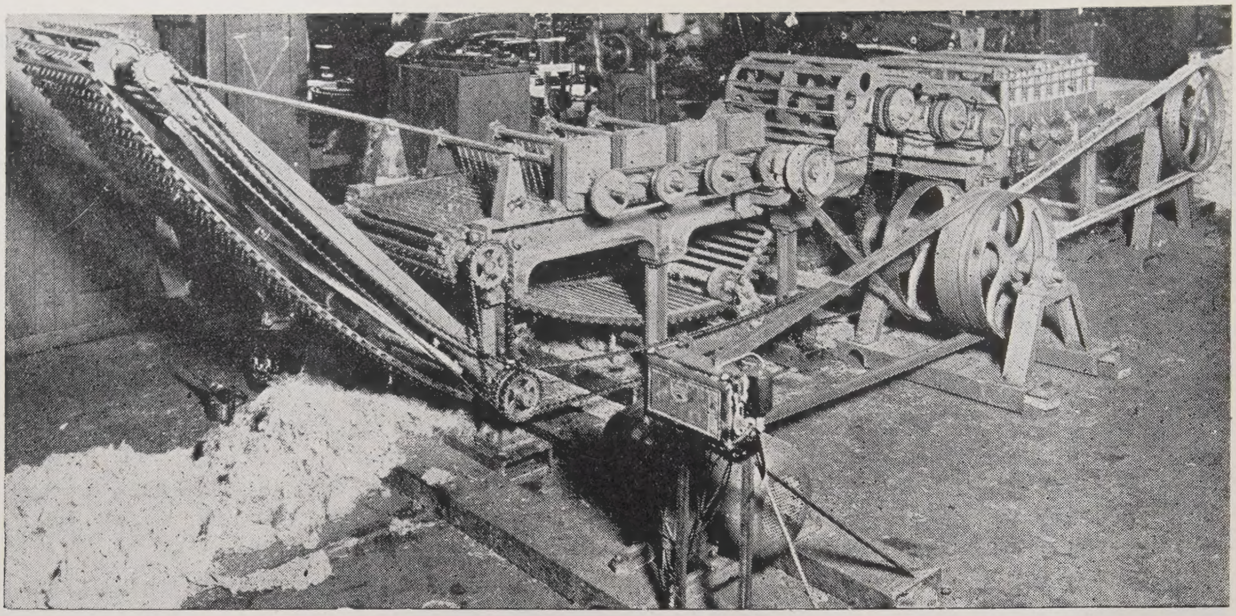
Even if the explanation of expediency is accepted, there is still the criticism that the objective could have been achieved with less financial loss than has been experienced. This may or may not be true, since we have so little upon which to base comparisons. We have not seen a statement from any country which could be used for purposes of comparison with those prepared each year covering the industry in New Zealand, in which are included the cost of development, depreciation on all plant and buildings, and interest charged at 4 per cent. on all money used in the establishment and conduct of the industry. Even if such statements were available, comparisons would be difficult, because whereas in New Zealand our straw is almost entirely tank retted, other methods are adopted elsewhere. In Ireland it is mostly dam retted, in Australia dew retted, and in England most of the fibre is not retted, but green or natural flax is produced direct from the unretted straw. We do not in fact know what losses are being experienced in other countries, and therefore comparisons are not possible.

It is interesting to note, however, that in Northern Ireland, apart from paying prices equivalent to those fixed for New Zealand, the growers are paid a bonus of £10 per acre for growing flax, and that in this past season an area of over 100,000 acres of flax was sown. Nevertheless the cost of production in New Zealand has given us the gravest concern. This has been accentuated by the realisation that we are operating in trust for the British Government, and if the production costs in New Zealand are in excess of those in other countries, then we are to that extent increasing the cost of the war, and it will be the British taxpayer and not the New Zealand taxpayer who will have to meet the major portion of that increase.

While far from feeling complacent about the position, there are nevertheless several points to which attention might be drawn before judgment is passed.

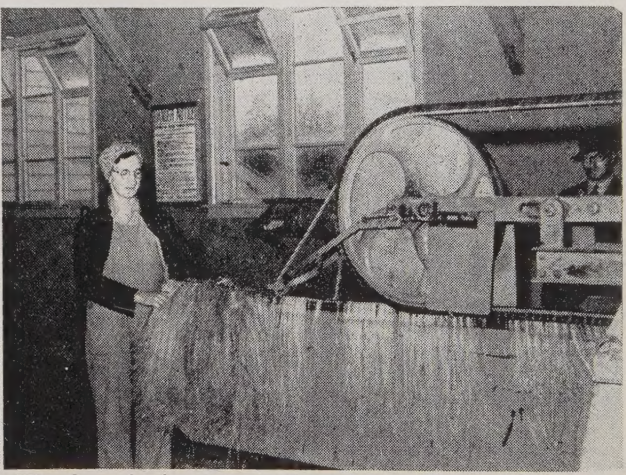
Difficulties

Those who know linen flax will agree that it has been produced most successfully where it has been undertaken as a peasant industry. In fact it may be said that success has not so far been proved on any large scale such as that attempted in New Zealand and Australia. Immediately efforts are made to mechanise the industry and to introduce mass production difficulties arise, waste is increased, and quality is impaired. It is doubtful whether in any industry are to be found problems at once so



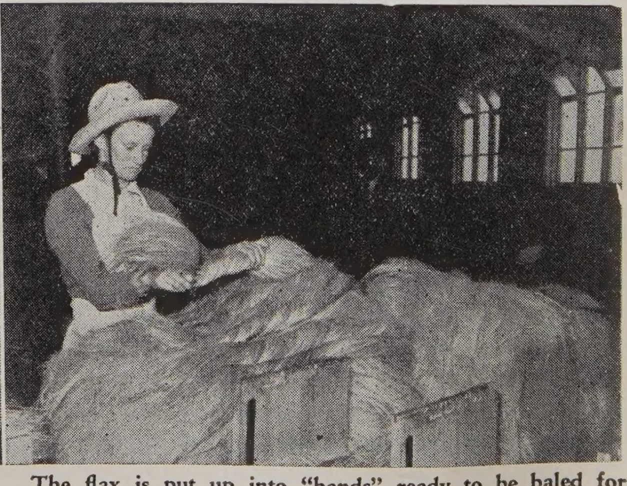
All the machinery had to be built in New Zealand, some of it being of entirely new design, such as this tow scutcher. Construction of machinery commenced in July, 1940.

The straw is gaited in the field for drying.



The first wheels commenced turning out flax in March, 1941. ["Star-Sun" photo]

Retting tanks are filled with straw.



The flax is put up into "hands" ready to be baled for export to Great Britain. ["Star-Sun" photo] diversified in nature and so difficult to solve as are those associated with linen flax. Nevetheless during the first year, with no practical experience in the commercial growing, harvesting, and processing of flax, we operated 10 factories. Since factory managers received only a little training and for the rest had to learn by trial and error, a financial success was not to be expected. When in the second year we hoped for an opportunity of consolidating the factories already established we found that an increased demand for fibre necessitated the erection of six more factories, and five of the factories already in operation had to be changed over from dew retting to tank retting, involving structural alterations. We had almost to start all over again with only five factories continuing normally and 11 either being brought into production or changing over in method of production. The result of the year's operations was a substantial loss, although no greater per factory than in the first year.

It was not till the third year that we found it possible to settle down to production unhampered by radical changes. We produced during that year nearly as much fibre as had been produced during the two previous years, when the financial position improved to the extent of £100,000. During that year also the group of five factories in Mid- and South Canterbury showed between them a profit of £13,300, only one factory in the group experiencing a loss. On the other hand, a loss of £17,000 was experienced at one factory alone, occasioned by the fact that only a very small amount of crop was available for processing.

Indeed, the shortage of crop has been a serious factor contributing to our financial losses, and during 1942-43 only one half of the factories were geared up to full production, the balance being geared down to the amount of crop available. This has necessarily resulted in overhead costs being unduly high.

Realising as we did the urgency of supplies, all our efforts were concentrated on production, even though we knew that in doing so we were neglecting to a large extent the economic aspect. We have processed straw which we knew could be regarded only as a liability financially, although an asset in production. We have extended into areas and districts that at best could be regarded as marginal, because even though the straw might be poor and unprofitable, and even though it necessitated minimum guarantees to the growers, it still gave some fibre to swell our exports. Fibre had to be produced, economically if possible, but if not economically it had still to be produced, and that policy has been the driving force of our efforts in the past.

That policy was right, and we have no reason to be apologetic. The growers and factory workers may rest assured that Great Britain has expressed ample appreciation of our efforts, which have not been in vain, but on the contrary have been and still are of very great service to the British Ministry of Supply in the conduct of the war.

2. ATTAINMENTS.

It is not strictly correct to say that the inauguration of the linen flax industry in New Zealand was entirely due to the war. The fact is that in 1939 we had already decided to build two semi-commercial tanks and run a pilot factory to test slowly and carefully the possibilities of fibre production in New Zealand with a view, perhaps, to increasing production should the preliminary trials prove promising. The industry, however, as set up in 1940 and 1941 was purely for war purposes. The objective was to supply Great Britain with flax, which was needed in the prosecution of the war. In this objective New Zealand has been successful, and it might mitigate criticism were the attainments more generally known.

The acreage sown and the area and tonnage harvested each season have been as follows:—

Season.		Area Sown. Acres.	Area harvested for fibre. Acres.	Wgt. crop for fibre. Tons.
1940-41	.. ..	13,123	9,005	17,585
1941-42	.. ..	20,202	18,000	37,301
1942-43	.. ..	21,858	17,496	33,526
1943-44	.. ..	9,849	6,884	13,268
Total	.. ..	65,032	51,385	101,680

All but a few hundred tons of the crop now on hand will be processed by March 31, 1945, and it is estimated that in 1944-45 the area will be about 14,000 acres. This will be 7,000 acres short of the requirements to maintain existing factories in full production till March 31, 1946.

The weight and value of the main products of our factories have been:—

Period Ended.	LINE FIBRE. Tons.	LINE FIBRE. Value.	TOW. Tons.	TOW. Value.	SEED. Tons.	SEED. Value.	BY-PRODUCTS. Value.	TOTAL.
		£		£		£	£	£
31/1/42	565	106,977	165	5,827	3,074	77,525	3,078	193,407
31/3/43 (14 mos.)	1,641	370,144	957	71,263	4,529	106,372	10,827	558,606
31/3/44	1,899	447,194	1,103	75,537	3,964	84,969	18,722	626,422
TOTAL	4,105	£924,315	2,225	£152,627	11,567	£268,866	£32,627	£1,378,435

From the above table it will be seen that during the three factory years ended March 31, 1944, 6,330 tons of line fibre and rescutched tow valued at £1,076,942 have been produced.

All fibre and tow have been exported to Great Britain, with the exception of 353 tons of fibre and 72 tons of tow, which up to March 31 last had been converted locally into seaming twines, ham cords, shop twines, marline, halyard, etc., and sewing thread for the manufacture of woolpacks. Had this fibre not been available in New Zealand, it would have been difficult to find substitutes which could have been used for internal requirements.

Since seed was being produced in excess of requirements for resowing it was necessary to find an outlet for the surplus, and the manufacture of linseed oil was therefore declared a licensed industry in order to attract commercial interests. One licence was issued and a factory was erected in Dunedin. The seed supplied by the linen flax industry alone has been sufficient to produce one-third of New Zealand's requirements in linseed oil, and in view of the world shortage of oil this was a most fortunate occurrence. The production of oil in New Zealand in turn rendered available in this country many thousands of tons of linseed oil cake, which was formerly imported. Another important stock food has been manufactured from the chaff or bolls of the seed heads. This material has been ground and marketed as linmeal, and has proved a valuable contribution to the stock food position during a very difficult period.

Fairly large stocks of tow have accumulated at some factories, and while much of this material has been scutched and exported to Great Britain, the position is that in all countries this type of fibre has been overproduced, and our efforts in this direction have had to be restricted. The reason for this restriction has been because Great Britain had not sufficient machinery to deal with the quantity of tow coming forward. Efforts therefore were made to find alternative uses for tow, and a very promising one has now been discovered in the manufacture of felts. It is therefore confidently hoped to use in New Zealand all the surplus tow that is now available.

The year ended March 31, 1944, was very satisfactory from the point of view of production. Our objective was 2,000 tons of line fibre and 1,000 tons of tow, or a total of 3,000 tons. Our actual production was 1,899 tons line and 1,103 tons of tow, or a total of 3,002 tons. In addition to this nearly 4,000 tons of seed were produced, and the total value of sales for the period amounted to £626,422. Taking into account the already explained circumstances of marginal areas and the necessity for processing poor crops, the improved financial position during this period was reasonably satisfactory. The loss of £80,587 included the writing-off of £25,000 in the value of tow stocks for the reason that Great Britain was not able to take increased quantities. Other items contributing towards this loss include approximately £45,000 interest payable to Treasury, £33,876 written off as depreciation, and £3,600 appropriated to insurance reserve.

The cost of producing a ton of fibre has been steadily reduced. This may be accounted for by an improvement in the growing and processing of the crops. Since 1 per cent. of fibre in the crop is worth to the industry £70,000, the percentage of fibre obtained is the most reliable measure of progress. It is therefore interesting to note that the improvement in fibre percentages has been as follows:—

Period ending:	31/1/42.	31/3/43.	31/3/44.	31/3/45.
Fibre percentage obtained ..	4.97	5.75	6.4	7.0 (objective)

Unfortunately the objective of 7 per cent. for the period ending March 31, 1945, is not likely to be attained. A very large proportion of the 1943-44 crop was low in fibre content, a condition which may have been occasioned by late sowing.

The purpose of the establishment of this industry in New Zealand as a war effort was to supply Great Britain with fibre, and this objective has in a very large measure been attained.

3. THE PRESENT AND FUTURE.

The Present

The extensive production of flax in New Zealand was undertaken on behalf of the British Government under an agreement whereby they accepted all fibre produced for a period extending to 12 months following the cessation of hostilities with Germany. The British Government offered later to meet the cost of production, and after the war to come to some mutual agreement with New Zealand in regard to capital expenditure, having in view the possibility that New Zealand might wish to carry on some factories as a peace-time industry.

Early this year it was realised that unless we were able to increase the price to the grower, we were not likely to obtain sufficient crop to maintain our factories in full production. An approach was therefore made to the British Ministry of Supply, and after very careful consideration had been given to the proposal a reply was received which indicated to us for the first time that the crisis in regard to supplies was easing, and that Great Britain would be prepared to take the risk of some decline in acreage, rather than to increase the present cost. The cable was received on August 2, 1944, and read as follows:—

> "We have had further discussion with Ministry of Supply, who are very grateful for the invaluable help given during the critical period and are reluctant to take any action detrimental to New Zealand interests. However, on the proposal to pay increased price for flax straw they would prefer not to agree to pay any increase for crop to be sown this spring. Having regard to (1) the improvement of the position of supplies of flax for essential purposes, (2) the high price already being paid, they are prepared to take the risk of some decline in acreage at the present price, and request that if practicable, acreage be maintained in close proximity to the most efficient factories, thereby permitting the maximum amount of long-scutched fibre to be obtained from the area cultivated."

Reports to hand indicating that for the first time since the war started some fibre and tow have been released by the British Ministry of Supply for civilian needs confirm the

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opinion that the crisis is passing. It does not on the other hand indicate that Great Britain is not in need of our flax. On the contrary we must assume that they will wish to continue taking our flax for a period up to 12 months after hostilities cease, and there are indications that at the conclusion of this agreement they may still wish to take flax under some other arrangement. One can appreciate their point of view now that they see the crisis passing. An increase in price in New Zealand may very well have repercussions in other countries, and moreover an increase in price might have the effect of extending the area being sown on marginal land, which, however necessary it may have been in the past, should not be so necessary now in view of the improved position in regard to supplies.

Such is the position as we see it at present. Whether the 1944-45 crop is to be the last to be grown under the agreement with Britain may not be known till the cessation of hostilities with Germany, and whatever may be the future in regard to the 1945-46 crop it is quite certain that we are failing in our promise to Great Britain if we do not produce as much fibre as possible in 1944-45.

The Future

Behind all our efforts at producing flax as a war effort has been a hope that, necessarily on a smaller scale, the industry might survive in peacetime to produce sufficient fibre for our internal needs. Attention has been drawn to the fact that there is no promise of an export trade, but a little consideration on this matter must surely convince anyone that a permanent export trade could never have been envisaged. All that we have hoped for and all that we are striving for so far as New Zealand is concerned is that sufficient fibre will continue to be produced to meet our own internal requirements.

The fact that three of the smallest factories have been closed owing to the lack of crop is a matter to be deplored. On the other hand, the fact that we may have to close more factories in the future is certainly no indication of failure. It must be clear that when Britain's requirements have been fulfilled it is inevitable that some factories will have to close, since our post-war requirements are not likely to exceed one-half of our present production. In Australia, by comparison, the war objective has been to grow 70,000 acres of flax, but it is generally expected that post-war requirements there will not exceed 20,000 acres. Therefore a very large proportion of the industry there will have to be closed. It is estimated that Great Britain has sown this past year about 220,000 acres, but in planning for the post-war period they hope to maintain an area of only 100,000 acres. If, then, New Zealand has to close down one-half the factories which are now in operation, this fact does not indicate failure. On the contrary, if we can continue to maintain six or seven factories in New Zealand to supply our own requirements in post-war years, we shall have attained a very useful objective.

There arises then the question as to what chance we might have in New Zealand of maintaining a limited number of factories in production. Two firms were recently granted licences to import and operate flax-spinning machinery in New Zealand, and it can be anticipated that there will develop a weaving industry to utilise the yarns from the spinning mills for the manufacture of canvases, fire hose, and other heavy textiles. It is, of course, very desirable to have a secondary industry with its roots in the soil, but the point at issue as to whether such an industry devoted to spinning will draw its supplies of raw fibre from overseas or from New Zealand is a matter for Government policy.

As far as one can judge there is a substantial difference per ton between what it would cost us to produce fibre in New Zealand and the price at which similar fibre might be landed in New Zealand in post-war years, when trade has resumed its normal level. For some years the price may remain high, as it did after the last war. when the highest prices were not attained until 1920. We may therefore have a period of high prices, and during this period an opportunity of reducing the cost per ton of fibre by bridging this difference. It is in our opinion worth the attempt, and there are reasons for supposing that it is not altogether impossible.

An improvement in the mass production methods adopted in the past is necessary if the industry is to survive. The main drive must be in the direction of better crops and better handling, both in the field and factory. We are beginning to realise the truth of the statement generally made overseas that 75 per cent. of the industry's problem is associated with the growing and harvesting of the crop. It is true that straw can be ruined at the factory and that factory operations certainly offer scope for improvement, but a far wider scope for improvement is to be found in the growing and the harvesting of the crop. This fact has been amply demonstrated by comparisons recently made between straw grown in Ireland and Australia with that grown in New Zealand. The fibre yield depends far more on the nature of the crop delivered to the factory than on any operations undertaken within the factory.

We in New Zealand have no reason to be ashamed of our efforts to help Great Britain in this matter. Admittedly fibre has cost more to produce than one had anticipated, but it had to be decided in 1940-41 whether to confine the industry within economic proportions or to expand to the uttermost, regardless of financial consequences. Had we not expanded, there were other consequences of far greater moment than those of finance to be faced. It was and is a war industry. If out of this we can establish a small permanent peace-time industry our efforts will not have been in vain.

◆

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						No. bushels per sack.
Barley ..	50lb.	reckoned	to	the	bushel	4
Beans ..	65lb.	"	"	"	"	3
Bran or Pollard	20lb.	"	"	"	"	7 to 10
Maize ..	56lb.	"	"	"	"	3½
Oats ..	40lb.	"	"	"	"	4
Peas ..	60lb.	"	"	"	"	3½
Ryecorn	54lb.	"	"	"	"	3½
Wheat	60lb.	"	"	"	"	3
Ryegrass	20lb.	"	"	"	"	6

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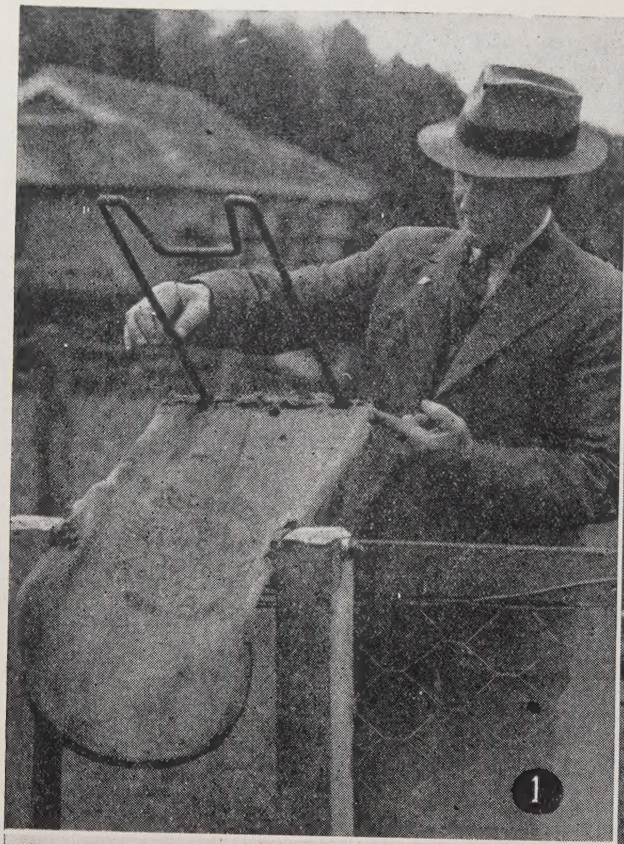
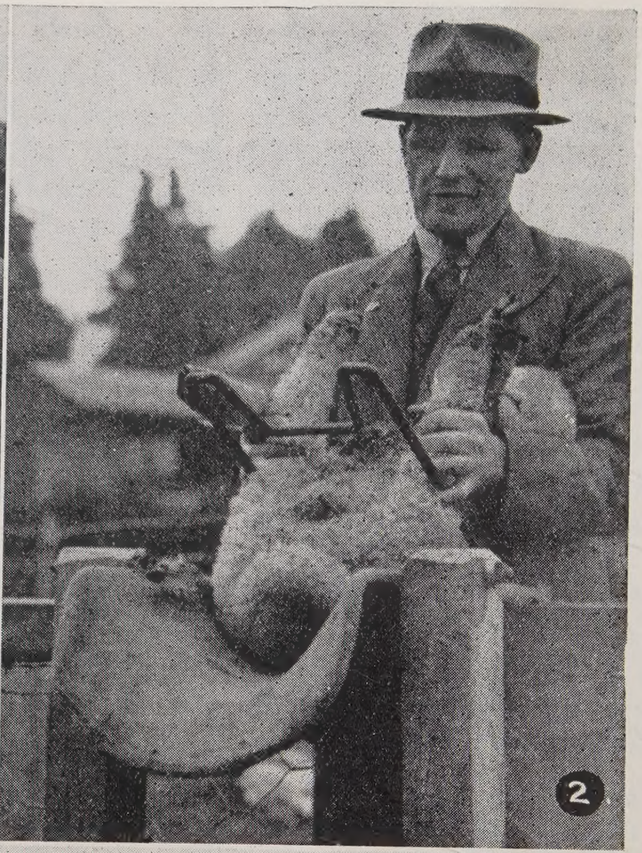
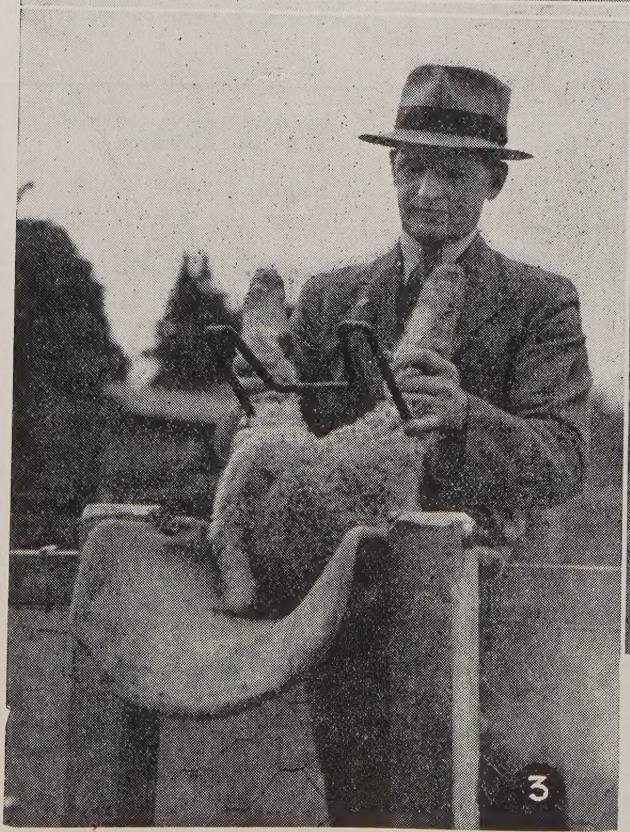
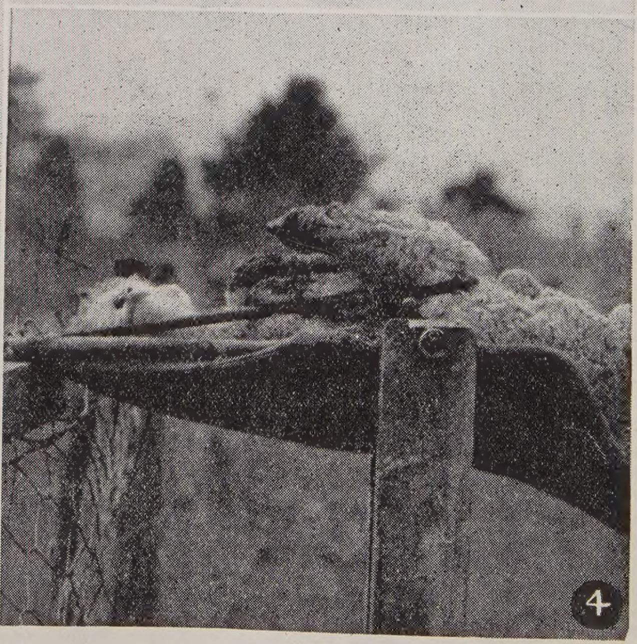








1. The trap erected.
2. Placing the lamb in position, with trap raised.
3. The next stage.
4. Lamb secured in trap.

Trap for Holding Lambs for Docking

THE accompanying diagram and illustrations show a device for holding lambs for docking described by Mr. V. Ravenwood, of the Livestock Division, Department of Agriculture.

It consists of a framework of 3-8in. iron, on which is hinged a trap of the same. The hinges are made by turning the ends of the iron around the bar of the frame, and should move freely.

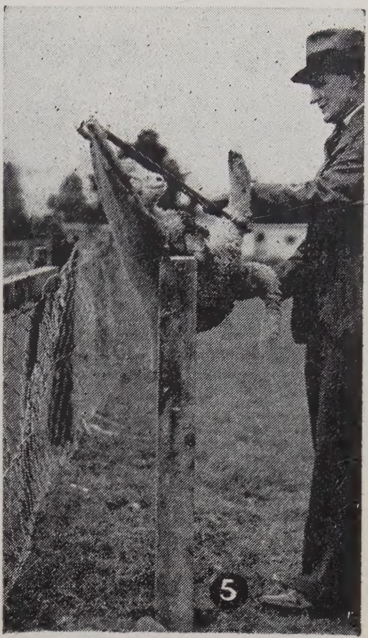
Measurements are important, particularly of the bends of the trap and the position of bolt holes. When the framework is made a piece of sacking or woolpack material is stitched tightly to the frame. This also serves to hold the hinges in place.

The device is set up to rotate on two light posts set outside the temporary docking pen, so that the hinged end of the frame rests on the rail of the pen.

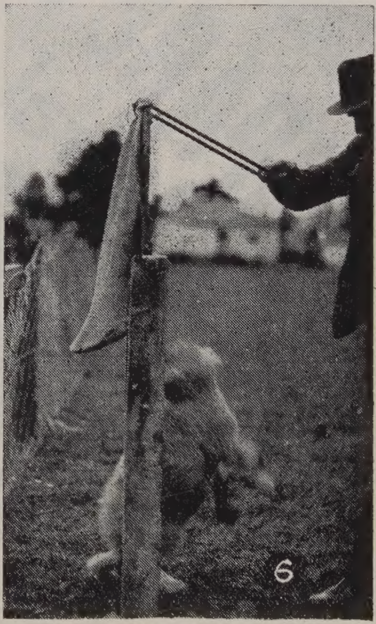
The method of use is illustrated. The catcher secures a lamb in the usual way, raises the trap (see Figs. 2 and 3), and places the lamb on the bed of the frame, lowering the trap, which secures the hind legs above the hocks. The lamb should be drawn downward by pulling on the tail to secure it properly (Fig. 4).

On completion of docking the lamb is released by the operator grasping and pulling on the cross member of the trap, which cants the whole frame (Figs. 5 and 6).

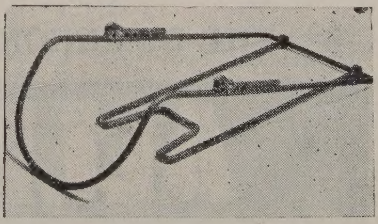
The trap is convenient for one man operating on his own, or if desired two or three could be erected, which would facilitate catching and holding.

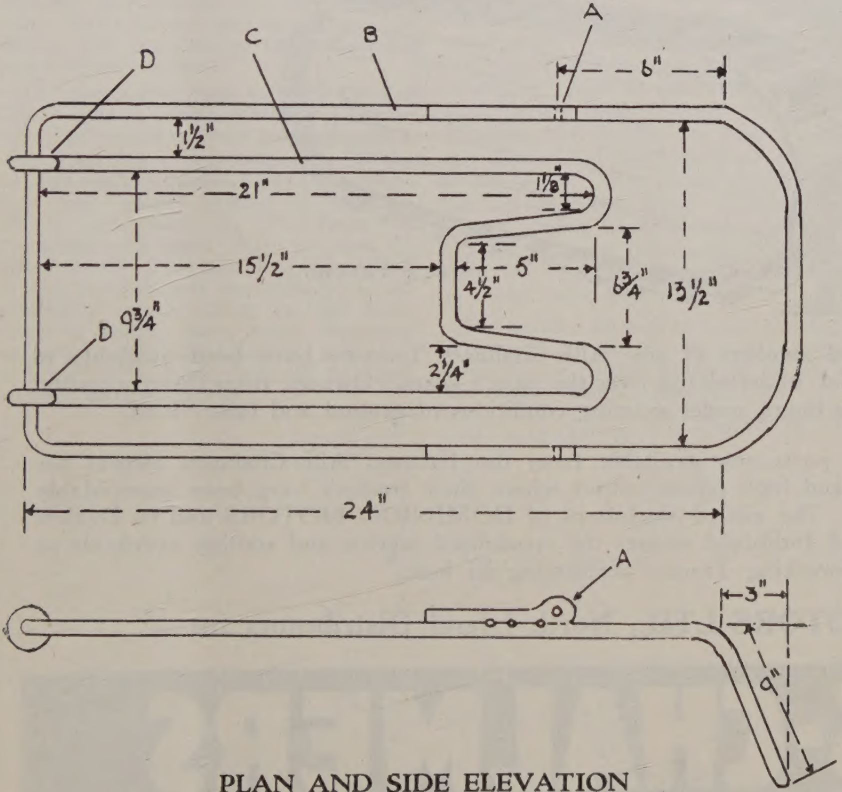


5. First stage of release.

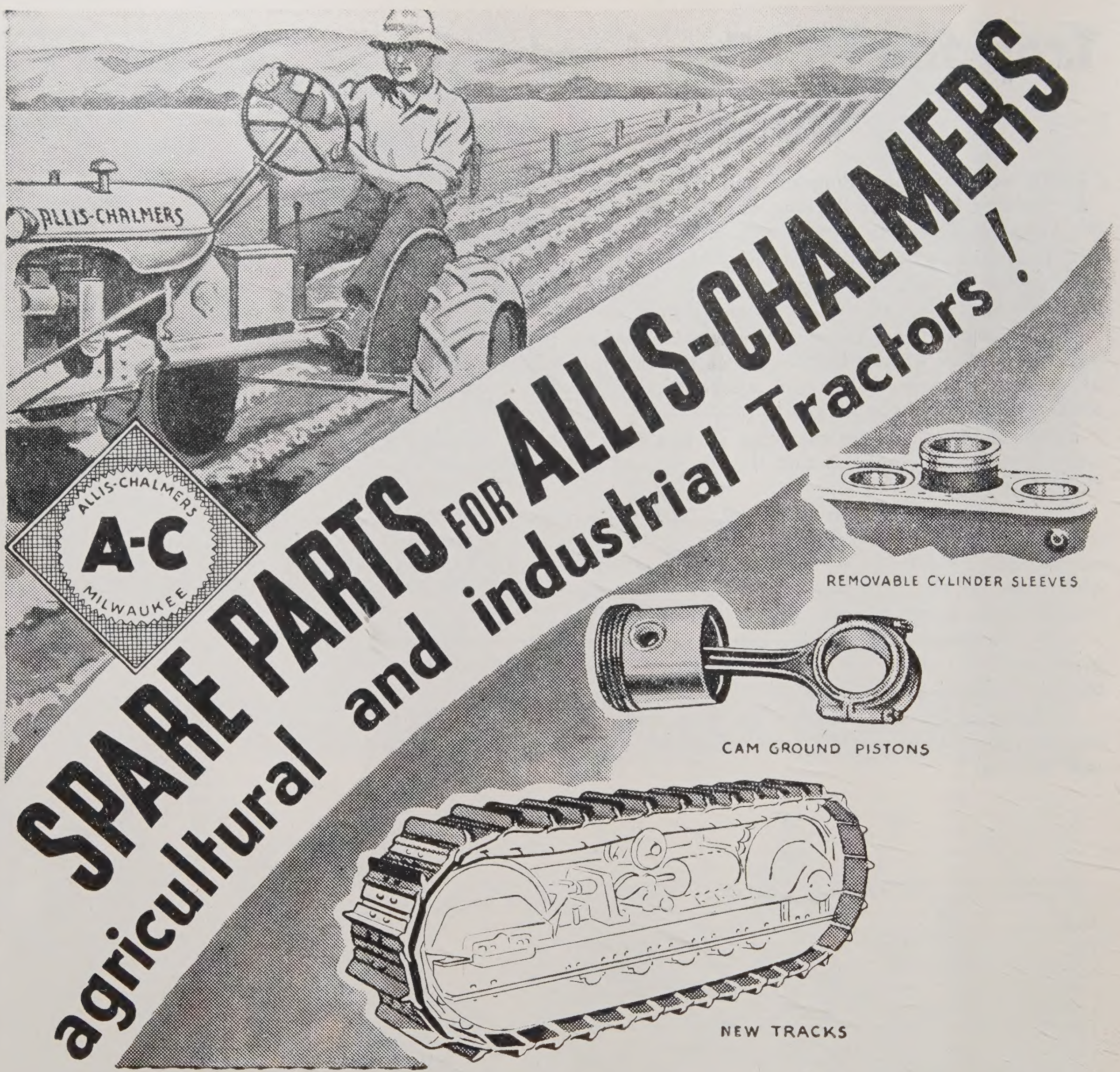


6. The lamb released.





PLAN AND SIDE ELEVATION
A. Bolt holes. B. Frame. C. Trap. D. Hinges.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STUDIES IN FARM MANAGEMENT

Otago Pastoral Farm

CENTRAL Otago, with its low rainfall and rather severe climate, differs materially from other farming districts. This article describes the general farming conditions of the district, as well as the management methods adopted on a typical sheep run.

By

G. G. CALDER,

Instructor in Agriculture, Alexandra

CENTRAL OTAGO, of which the Vincent County represents a considerable proportion, lies to the east of the high, snow-clad dividing range of the South Island, and occupies much of the interior portion of the southern part of the island.

Topography

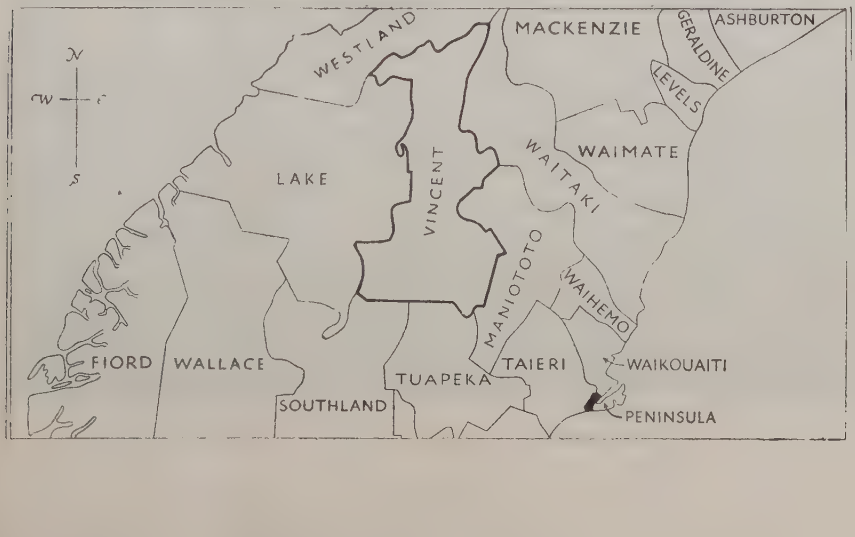
For the most part the area is mountainous, particularly on the western side. Towards the east the ranges are lower, less precipitous, and somewhat more widely spaced.

The prevailing rock through Central Otago is mica schist, which is a laminated and comparatively soft formation.

In past ages the majority of the valleys were subjected to very extensive and severe glacial action, the effects of which in the form of moraines and scars may be seen in many parts. This action has resulted in the carving and smoothing out of extensive valleys along various fault lines, in which have been deposited not only mica schist debris, but also, in some parts, rocks and soil brought in from external areas.

The rivers of the district have, in conjunction with the relatively rapid erosion of the mountain ranges, left extensive areas of terraced country. The three large lakes, Wakatipu, Wanaka, and Hawea, are mainly snow and glacier fed from the high country to the west. These lakes give rise to the Rivers Kawarau, Clutha, and Hawea, which, together with numerous smaller streams, ultimately join to form the Molyneux River, which has its outlet near Balclutha.

The eastern district of Central Otago is drained by the snow- and rain-fed Taieri River, which flows out to sea a few miles south of Dunedin.



The most important valleys and the mountain ranges embracing them are as follows:—

1. **Lower Shotover Area:** This undulating, ice-worn valley of some 7,000 acres is bounded by the Carrick Range on one side and the end of the Remarkables on the other.
2. **Clutha Valley Area:** Extending from the town of Cromwell to Lakes Hawea and Wanaka, and bounded by the Dunstan and Pisa Ranges, this long, wandering valley contains an area of some 80,000 acres. Part is morainic, part river terraces, and part old lake bed. Through this valley flows the Clutha River.
3. On the other side of the Dunstan Range, between it and Raggedy Range, lies another large depression known as the **Manuherikia Valley.** At the Alexandra end of the valley the area is mainly old terraces, but in the area reaching from Chatto Creek to St. Bathans is chiefly an old but undulating lake bed. The extent of this valley is some 120,000 acres. Through this valley flows the Manuherikia River, which joins the Molyneux at Alexandra.
4. **Ida Valley:** Some 29,000 acres lying between the Raggedy Range and Rough Ridge comprise this old lake bed.
5. The **Maniototo Plain** is the most extensive area of relatively flat country in Central Otago. Its 150,000 acres are in a roughly triangular-shaped block, with the Rock and Pillar Range and Rough Ridge on the sides and the Hawkdun Range as the base.

The mountain ranges in general are relatively flat-topped and rise to a height of some 5,000ft. The valleys vary considerably in altitude and range from 500 to 1,500ft. above sea level.

Climate

The climate of Central Otago is almost continental. It experiences a hot, dry summer, with temperatures

CENTRAL OTAGO

Depleted country.

Mica schist rock.

Barren hill face.

Shotover district.

Hawea Flat.

Shotover River.

frequently in the 90's. During the winter the ranges are snow covered and frosts in the valleys are often continuous for weeks at a time, with temperatures frequently dropping to 10 deg. F. and lower. In the central area around Alexandra the annual rainfall is approximately 12in. On the outer perimeter of the area the rainfall is double this amount.

At the time the country was first settled practically the whole area was covered with tussock. Bush was absent, practically the only large plant being the matagouri shrub, which was present throughout.

Settlement

The settlement of Central Otago commenced in earnest during the late 1850's, when large areas were taken up by the runholders. During the early and middle sixties when the gold rush was at its height the population of the area was estimated as being well over 15,000 persons. This influx of miners at such an early stage of settlement was responsible for considerable embarrassment to the settlers, who were struggling to establish and stock their runs.

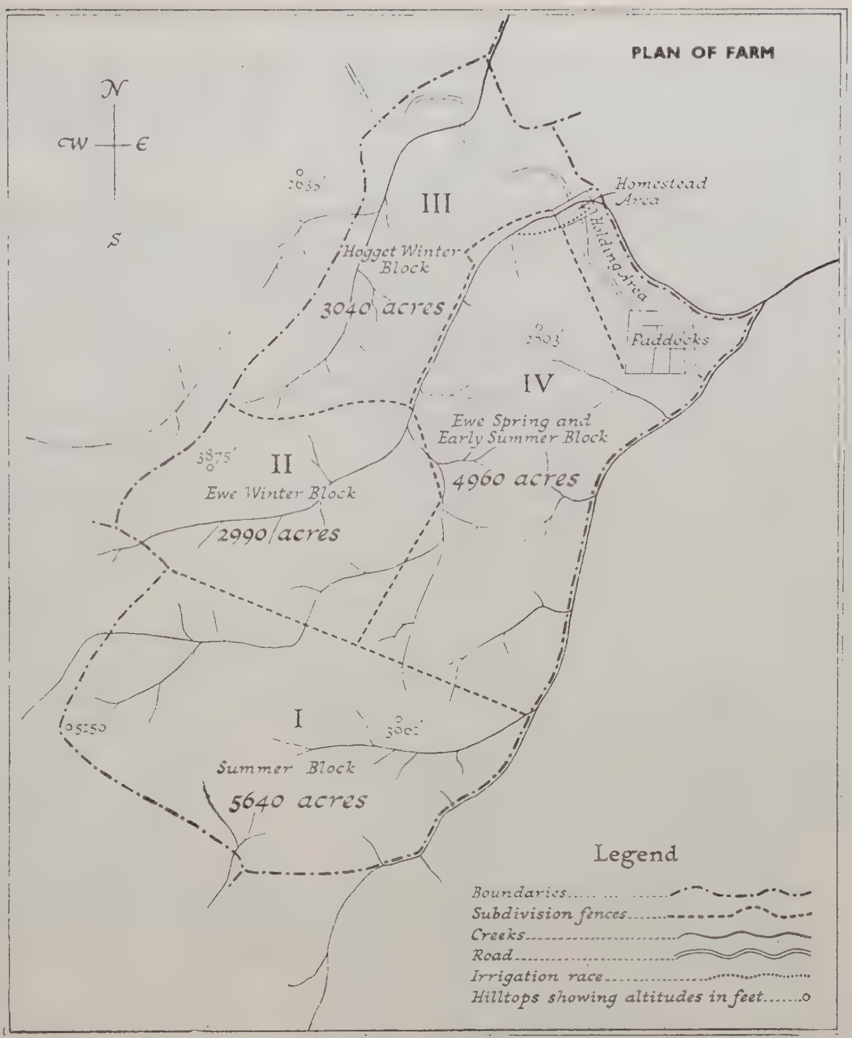
To the early gold miners, however, much is owed, for to them can be traced the beginning of the irrigation of Central Otago and the fruit industry. They also gave an impetus to the closer settlement of the district, in the growing of wheat, oats, and malting barley. Disused flour mills, breweries, hotels, stables, and even abandoned townships tell a story of much activity and horse travel by the hardy early populace of the county and the need of producing their own food and horse feed.

Today the scars of gold-mining show up all over the county, here a washed-out face of a hill where large stones are packed or thrown to one side and the finer soil and gravel washed away; there a gully that has had the same treatment. The same thing can be seen along banks of the rivers or with small streams, the whole bed as well as the banks of which have been worked out. However, most striking result of gold-mining is the many acres of gold-dredged land which were once good to fair land, but which are now completely ruined and are an uneven mass of stones and coarse gravel.

Land Utilisation

Present-day farming in Central Otago may be divided into the following major groups:—

1. The large sheep runs.
2. The arable farming areas on non-irrigated land.
3. The fat lamb and dairying farms on irrigated country.
4. The orchard and small fruit farmers.



On the deeper alluvial soils there are areas that have been cropped steadily for the last 70 years with grain and recently with pea and grain crops. Over this period they have never been in grass, and satisfactory crops are still obtained, due to the natural fertility of the mica schist soils. The gravelly soils and gravel subsoils give the excellent drainage which helps to make irrigation in this district so successful.

On the valley slopes and flats are situated irrigated farms where dairying and fat lamb production are carried on. Around Alexandra, Clyde, and Cromwell are orchards which produce some of the best stone fruit in the Dominion. Hawea Flat is mainly a grain-growing district, with barley, peas, wheat, ryegrass, and clover seed the principal crops; header-harvesters are strongly competing with contract threshing mills for the threshing of the good-yielding crops produced.

The Omakau-Lauder-Becks district in the Manuherikia River Valley is also a good mixed farming district, producing fat lambs, grain, peas, ryegrass, and clover seed, with some dairy farming. Above the irrigation level are the sheep stations, producing wool, store and some fat lambs, cull ewes, and fat wethers.

Pasture and other growth usually commences towards the end of September. Under irrigation this growth is rapid and luxuriant and carries on until the heavy frosts set in, in April or May. On areas that are not under irrigation pasture growth stops and dries up in November, but comes away for a short period during March, until the frosts bring all growth to a stop. During June and July the ground is usually frozen and nothing can be done in the way of working it.

Thunderstorms may be encountered any time during the summer and the ranges get many showers of rain which do not reach the valleys. This moisture is held on the good tussock country and assists growth throughout the drier periods.

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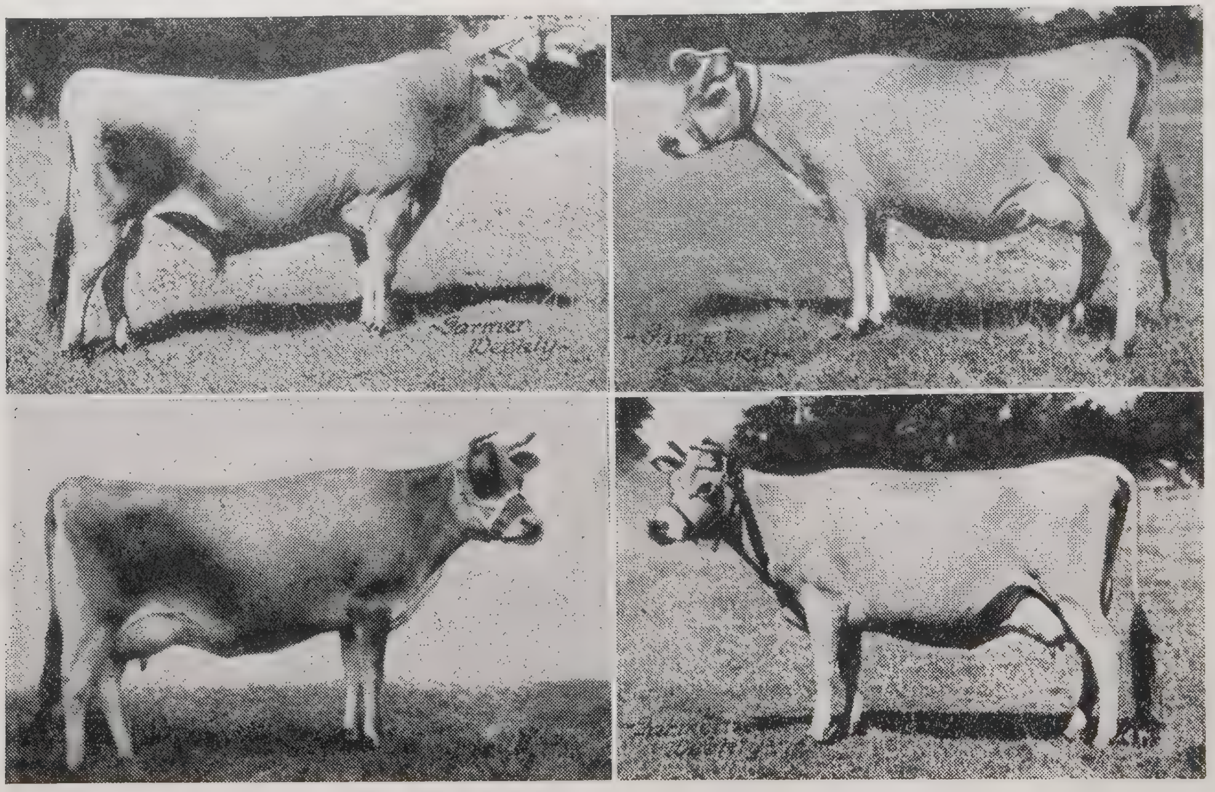

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CROPS AND LIVESTOCK—VINCENT COUNTY, 1941-42.

Area occupied land	1,599,842	acres
Annual crops	8,846	„
Sown pasture	107,604	„
Area irrigated (approx.)	45,000	„
Orchards in bearing	1,012	„
Sheep shorn	434,274	
Total cattle	8,150	
Dairy cows	2,443	
Total pigs	1,140	

As can be gauged from the above statistics sheep farming occupies the major part of the county. There are two distinct classes of sheep run country, i.e., summer country and winter country. Summer country is the highest country or land with a southerly or south-easterly aspect and is the area that is snow covered and unsafe for stock in the winter. Consequently it is grazed in the summer and autumn, as a rule, after shearing, until the autumn muster. Rabbits usually do not inhabit summer country, consequently it is completely spelled from grazing during the winter, spring, and early summer. Thus no serious deterioration of pastures on this class of country is caused. The winter country is usually lower than the summer country or has a warm northerly or north-westerly aspect, and under normal seasons is safe for stock during the winter period. It is on the winter country that rabbits are most numerous and cause most damage to the native pastures.

Although the whole of the country was originally well covered with grasses and tussocks, the advent of grazing animals, especially sheep and rabbits, has been responsible for the native pastures deteriorating, especially in the lighter-rainfall area. While the dark faces and gullies have a poor to fair covering of herbage, the sunny faces are more frequently than not practically denuded of pasture plants. They present an uninspiring picture from a grazing point of view, and scabweed is the main vegetation to be found.

Losses of sheep through snow are the main cause of worry to most runholders. Every winter this disaster is possible if sheep are left too long on the summer country, or perhaps losses may be caused by a particularly early heavy snowstorm. The summer country is always well snow covered during the winter. Even the winter country usually has a fall of snow of some inches which may lie for some days or weeks during the winter. During exceptional winters the snowfall may be much heavier, necessitating snow raking and, if possible, feeding of the flock with hay, oat sheaves, or chaff for a short period. Normally stock go into the winter in good condition, and no supplementary feeding is supplied, except hay to paddock ewes and rams.

OTAGO PASTORAL FARM.

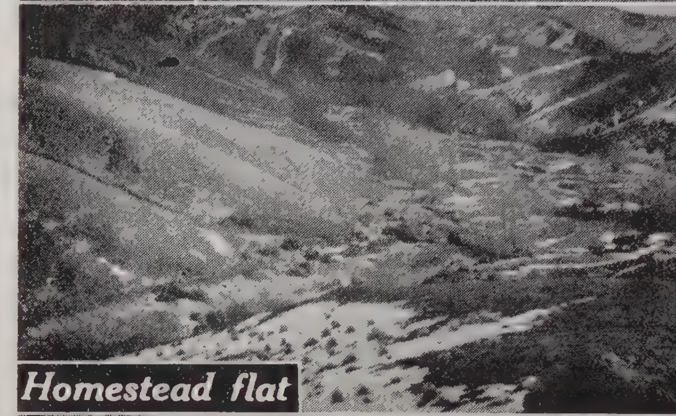
The study of the following Vincent County run can be taken as typical of many stations carrying flocks of about this size, although many variations will be found, depending on the area of summer and winter country in the holding, the area of arable land, and area of irrigated land, if any.

The area of this run is 17,326 acres in the lighter-rainfall area of approximately 16in. per annum. It consists of mainly ridgy rugged country ranging in altitude from 1,500ft. to 5,150ft., and is divided into five main grazing blocks. The largest block, shown on the plan as Block I, is the summer country of 5,640 acres, and is well covered with tussock and native grasses.

The three blocks shown on plan as Blocks II, III, and IV are all reasonably well covered with tussock growth on their dark faces, but are practically denuded of pasture plants on their sunny faces. Three small creeks run through the property, and along the banks are good swards of *Poa pratensis*, white clover, cocksfoot, brown-top, and *Danthonia pilosa*, with tussock.

The fifth block is known as the "Paddocks" and is an area of approximately 280 acres of comparatively flat land that has at some time or other been ploughed and is subdivided into seven fields. One field of 5 acres is in lucerne; 20 acres were in oats and are to be regrassed in the autumn; 30 acres were closed up and harvested for hay. A further area is being ploughed and worked up for spring oats. The remainder is the main fattening area of the run and is a mixture of a thin sward of cocksfoot, ryegrass, and white clover, together with dense areas of *Poa pratensis.*

Access



Homestead flat

Summer country

Winter country

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VIEWS IN VINCENT COUNTY

The homestead, shearing shed, dip, and yards are situated on a small flat, 20 acres of which are irrigated from the creek flowing through it by a gravity-fed race. The irrigated area is divided into four fields, which produce hay and carry cows, cattle, and horses. Two of them are used as holding paddocks during shearing and dipping. By adding a fence joining up existing fences between the homestead and "Paddocks" a handy area has been made for holding sheep during shearing and drafting operations. It consists mainly of a rocky face levelling off towards the "Paddocks," carrying very little feed except along the creek bed.

Stock

The flock comprises 1,150 wethers and 1,400 halfbred ewes, which last year gave a lambing of 905 lambs tailed. This is about the average lambing for the station. Of these 375 ewe lambs and 375 wether lambs are kept for replacements. Seventy-five lambs were sold as fats. Forty cull mixed-sexed lambs were sold with surplus stock. The remaining 40 lambs represent the normal loss from time of marking to autumn muster.

Fifty Corriedale rams are carried and a normal replacement is required of 12 young rams per year. Seven horses composed of hacks and light draught horses for team work with 5 cattle, 3 cows, and a pig comprise the remaining domesticated stock.

Production

During the 1943-44 season 25,060lb. of wool of a 50 to 56 count were produced and 60 odd woolly skins. Surplus stock were sold in the autumn as follows: 300 fat wethers, aged 6 years, which killed out at 49lb.; 230 cull ewes, aged 5 years; also the 75 fat lambs and 40 cull lambs mentioned above.

Labour

Three permanent men are employed, i.e., the owner and two shepherd-rabbiters. The owner does the routine work such as general supervision of the flock. The two shepherd-rabbiters are always available for all work when required such as mustering, drafting, dipping, lambing, harvesting, and fencing, and when not employed on seasonal or special work they are rabbiting. Two extra rabbiters are usually taken on during March 1 to October, and an extra musterer is employed for mustering. For shearing three blade men are employed. During the present season only one extra rabbiter was available. For extra musterers neighbours assist each other.

Management

In order to describe the operations of the run it appears to be most convenient to commence with the dipping muster, which takes place during March, when the whole flock goes through the yards and surplus stock is disposed of.

The dipping muster commenced on March 20 with four musterers for five days, when the whole run was mustered and all the stock dipped. The lambs were drafted off, eye-clipped, and weaned on to Block II, after a truck of fat lambs had been taken out. The annual draft of surplus cull ewes was taken out for the local sales, while two trucks of fat wethers were disposed of to freezing works. Another 150 cull wethers were driven to the "Paddocks" for fattening. Eighty woolly sheep were shorn and returned with all the remaining adult sheep to Block I.

A standard dip is used and ticks are well controlled. No lice or foot-rot are experienced, and only a very occasional fly strike. Only three sheep were affected by fly last season.

On May 1 110 fat wethers from the "Paddocks" were sold to freezing works, 40 being retained for killing.

On May 10 Block I was mustered by four men for one day on to Block IV. On the following day they were driven to the yards and homestead holding paddocks. One thousand three hundred ewes were drafted out and turned on to Block II with 48 rams, while 100 cull ewes and 2 rams were put into the "Paddocks" for fat lamb production. The 1,150 wethers were returned to Block I, where they winter well on sunny faces on the north part of the block. Some boundary riding to keep them from wandering off these sunny faces is required until the snow covers the rest of the block. From then on they require very little attention.

On June 10 the ewes, lambs, and rams were mustered on Block II by three men for one day on to the holding paddock. The lambs were then drafted out, eye-clipped, and turned on to Block III. Ewes and rams were also eye-clipped and returned to Block II. Feeding of hay was then commenced to cows and cattle at homestead.

Early August.—"Paddocks" ewes are brought in, crutched, and returned to "Paddocks" to lamb. Ewes and rams mustered from Block II, rams drafted out, ewes crutched and turned out on Block IV for lambing. Rams and killing wethers crutched and turned on to "Paddocks." Lucerne and pasture hay fed out to "Paddock" stock during August and September.

Middle of September, when frost is out of the ground, ploughing and cultivation of 20 acres for oats was commenced, also the cleaning of irrigation race at homestead.

October is a busy month with lambing.

November.—Oats are sown. Shearing commenced on November 10 with two shearers for one week when rams, "Paddock" ewes, hoggets, and killers were shorn and returned to their own block or paddocks. This is followed by tailing and marking of lambs on Block IV. End of November first irrigation of homestead area.

December 10.—Main shearing commences with four musterers and two shearers for two weeks. Last season November and December were exceptionally dry and no time was lost through wet weather. All shorn sheep were turned out on to Block IV and allowed to drift on to Block I. Hoggets were mustered on to Block IV, then all sheep except "Paddock" ewes, lambs, rams, and killers were driven on to Block I by end of December.

January.—Hay crops harvested and homestead area irrigated.

February.—Oats harvested and "Paddock" ewes and lambs turned on to stubble.

Supplementary Feed

Hay is supplied to cows and cattle during winter and early spring (May to end of September). Hay is fed to "Paddock" stock in August and September. Turnips are occasionally tried as a catch crop, but the seasons are usually too dry. This is not a regular practice, but may be tried when breaking up an old lea paddock.

Oats are grown for horse feed, but under occasional severe conditions they may be fed out to "Paddock" stock and when possible to the flock.

Topdressing

The annual allocation for topdressing is 8½cwt. This is applied to the hay and other irrigated fields at the homestead. Fertiliser is not sown with the oat crop. If a dry spring is experienced, the crop is practically a failure, irrespective of the use of fertiliser. If a fairly moist spring and early summer are experienced, a satisfactory oat crop is obtained without the use of fertilisers. The limiting factor to production here is moisture.

Rabbit Control

This is an essential part of the operations of a Vincent County runholder, as on this class of country it appears impossible to eradicate the rabbit. The broken nature of the land, together with the dry climate, produces ideal conditions for rabbit propagation. Rabbiting is carried on practically all the year round, except during periods of seasonal work. The late autumn, winter, and spring is the most suitable time, not only from a labour point of view, but while feed is going off or short rabbits are more easily caught.

One man will work from 140 to 170 traps and occasionally 200, until the frosts make the ground too hard for setting. Then poisoning with strychnine is carried out. This is usually done with carrots, although oats, apples, and swedes are sometimes used.

Sliced carrots are fed out two or three times on the same line until they are readily eaten, then the next feeding is done with poisoned carrots.

Last season 6 tons of carrots were used during the winter to poison 3,500 rabbits. Trapping accounted for 12,500 rabbits. When it is realised that as many as 45,000 rabbits per year were taken for two consecutive years off this property when it was taken over it can be realised that the position on the property referred to is satisfactory and that the rabbit is reasonably well controlled.

Carrying Capacity

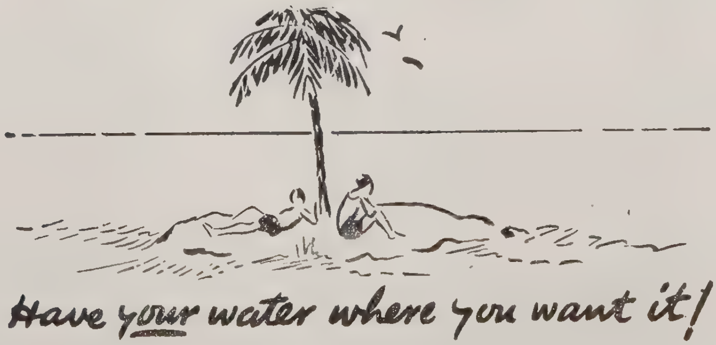
On this particular run the carrying capacity is 6¾ acres per sheep, although on surrounding run country somewhat similar to the run under discussion the carrying capacity may vary considerably above or below the figure quoted above.

This variation is due in part to the proportion of winter and summer country in the holding, in part to the degree of rabbit control, but mainly to the presence or otherwise of an irrigated area on the run. Where no irrigated land is available or no supplementary feed is produced the carrying capacity is naturally the lowest. Also the production of fat surplus stock is not possible. Some runs have no irrigation but have some good flats or ploughable land which are utilised for growing lucerne hay, pasture hay, chaff, or perhaps turnips, thus increasing the carrying capacity and the possibility of producing fat stock for sale.

Other runs have under irrigation fairly large areas on which are produced sufficient hay for winter feeding of the whole flock and sufficient irrigated paddocks on which to lamb the whole ewe flock. On this class of run, naturally enough, the carrying capacity is the highest, and they have advantages, too, in the production of fat surplus sheep and fat lambs.

In short the carrying capacity of Vincent County runs depends largely on the ability of the property to produce supplementary feed during the winter and early spring.

Thanks are expressed to the Lands and Survey Department for the drawings in this article.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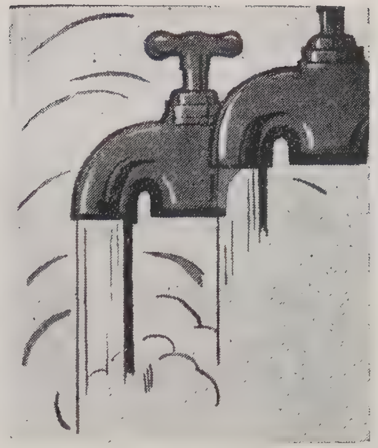
CLEANING OF MILKING MACHINES

Experiments Prove That Boiling Water Is Essential

THE question has often been asked: "Why are Dairy Division Instructors so insistent about the need for BOILING WATER to clean milking machines?" Occasionally someone with a little technical knowledge will back this question with the statement that even if boiling water is used, the vacuum which is applied to suck it through the machine will prevent the temperature of the water in the machine from rising higher than about 180 deg. F. Although this is quite correct, the need for boiling water still stands, as will be made clear by the following experiments.



THESE trials were carried out, with the assistance of Messrs. W. G. Whittleston, Physical Chemist, and H. G. Sawtell, to demonstrate what temperatures are actually reached when the water used is as close as possible to boiling point.

The experiments were carried out on a three-cow machine, and to ascertain the actual temperatures at various points within the machine thermometers in rubber stoppers were placed at suitable points. The principal ones were located in the overhead milk pipe at the junction of each tube leading from the teat-cups, and these thermometers were numbered 1, 2, and 3 corresponding to the teat-cups, number 1 being closest to the releaser. A thermometer was also fixed within the claw tube at the end of the milk pipe of No. 3 teat-cups, and another in the releaser.

A can of hot water was raised as nearly as possible to boiling with two powerful 2,000 watt immersion heaters. Owing to radiation and other losses it proved difficult to maintain the water actually at boiling point, but at the beginning of the experiment the temperature of the water in the can was fully 207 deg. F.

TRIALS DESCRIBED.

In the **first trial** only one bucketful containing two gallons of hot water was sucked through from No. 3 teat-cups. In the **second trial,** while the pipes were still a little warm from the first trial, two further bucketfuls of two gallons each were sucked through simultaneously from bails 2 and 3. The greater amount of water produced slightly higher temperatures throughout the machine. For the **third trial** some of the previously used water was again put through, but without heating to the same starting temperature. Four gallons were used through No. 3 teat-cups to provide enough to flood the vacuum tank, and for this purpose the releaser pulsator was shut off. The temperatures observed are shown in the accompanying table.

Several points are worth noting. In the first and second trials the filling of the buckets allowed the temperature to drop to 194 deg. F. In the first trial, with only two gallons, the temperature at the releaser was as low as 158 deg. F., as compared with 172 deg. in the second trial, achieved by the use of double quantity of **very** hot water. But when this double quantity of hot water was at only 180 deg. to begin with (in the third trial) it produced a correspondingly lower temperature of 158 deg. at the releaser.

— By —

G. M. MOIR,
Dairy Chemist, Wallaceville Dairy Laboratory.

During the trials the taps on the milk tube through which the hot water was being sucked were turned full open to give a quick flow. With a slower flow the temperature at the releaser would probably not be quite so high. During the flow the cups were not lifted in and out of the water as is sometimes done to produce surging. If that were done the temperatures inside the milk tube, especially towards the releaser, would tend to be a few degrees lower.

Under the vacuum used of 15 inches water boils at a temperature of about 180 deg. F. This means that when water of a higher temperature gets inside the pipes it immediately boils and is converted to steam, which occupies a very much larger volume than the water which produces it (actually about 1,600 times as great). This sudden increase in volume causes a surge of steam to pass through the machine, but as it passes it becomes condensed on the cold metal parts. The result is that before the hot water reaches distant parts, such as the releaser and vacuum tank, condensation of steam to water is taking place so as to raise the temperature of the metal. Thus, if actually boiling water is used, the extra heat which it contains is made use of to heat up the parts of the machine to the highest possible temperature.

PREVENTION OF MILK-STONE.

In pipes which become quickly filled with water the time interval between the heating with steam and with the water is negligible, but in other parts of the machine, such as the releaser and the vacuum tank, the metal is being heated with steam (as can be noticed by touching them), and this contributes to the baking on of milk residues which have not been properly rinsed off with cold water. This explains why deposits of milk-stone often gather on the upper part of the releaser chamber.

To prevent the formation of such deposits steps should be taken to see that the releaser is quite filled with cold water **before** the hot cleaning solution is applied. To do this the releaser-pulsator must be temporarily

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interrupted. If at the same time a stream of air is admitted through a tap fitted to the releaser, that will produce a vigorous surging and brushing action inside the releaser so as to get rid of milk accumulated inside.

TEMPERATURE DEG. F. AT DIFFERENT POINTS IN MILKING MACHINE.

	1st Trial.	2nd Trial.	3rd Trial
Amount of water	2 gallons	4 gallons	4 gallons
Can Temperature ..	207	205	—
Bucket Temperature .	194	194	180
No. 3 Claw " ..	189	190	—
No. 3 Thermometer ..	180	184	176
No. 2 " ..	178	184	174
No. 1 " ..	176	179	174
Releaser " ..	158	172	158
Vacuum Tank ..	—	—	154

REASON FOR BOILING WATER.

Three points can be made in reply to the suggestion that it is no advantage to use water hotter than say 185 deg. F. because under vacuum the temperature in the machine will never rise above 185 deg.

Firstly, the additional heat provided by water at higher temperature is all used to raise the machine to a temperature of 185 deg. and to keep it at that temperature longer than would otherwise occur. At high temperatures even a short additional time is valuable to increase the germicidal effect.

Secondly, if instead of asking for boiling water, some temperature such as 185 deg. were specified as adequate, many farmers would be satisfied with something like 160 or 170 deg.

Thirdly, even when boiling water is available, by the time it is filled into a bucket and carried into the shed the temperature has usually dropped appreciably. The hot solution is flushed through the machine so quickly that satisfactory cleaning results can be obtained only when the water is boiling to begin with.

If sufficiently hot water cannot be provided, two alternatives may be considered. One is to use a strong soda solution. For this purpose some "special soda ash mixture" is preferable, added at the rate of one teaspoonful per gallon **before** adding the caustic soda to the hot water. The amount of caustic may also be increased, but should not exceed one teaspoonful per gallon. The other alternative is to devise some method of filling the machine completely with soda solution in such a way that it can be left filled for some time, say half-an-hour or more.

Town Milk Supplies

ALTERATIONS to and the reorganisation of methods of the supply, collection, treatment and distribution of milk are proposed in the report of the Milk Commission on the supply of milk to the four metropolitan areas of Auckland, Wellington, Christchurch and Dunedin.

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Caustic Better Than Washing Soda

— By —

J. M. KRISTENSEN, Farm Dairy Instructor, Inglewood.

TRIALS were recently carried out in the milking shed of Mr. J. Bell, Junction Road, Inglewood, to ascertain the effect on the inflations of different cleaning methods. A complete set of new grey MB soft inflations was fitted to the milking machine, which has four sets of teat-cups, and to identify the inflations they were marked in large letters with ink pencil before fitting into the cups. Those for the first set of cups were lettered 1A, 1B, 1C, 1D, and for the second, 2A, 2B, and so on. Arrangements were made for Mr. Bell to clean the different sets of cups in different ways.

Group 1.

Group 1 was cleaned as recommended in the Dairy Division's Bulletin No. 118—that is, a liberal flushing through the cups of cold water, followed by at least one gallon of boiling water containing caustic soda at the rate of one heaped teaspoonful per four gallons, and finally another gallon of boiling water. This treatment was carried out **TWICE DAILY** after milking.

Group 2.

Group 2 was treated similarly to group 1 in the morning, but in the evening the use of caustic soda was omitted, the flushing being done with cold water followed by boiling water only.

WEIGHTS (GRAMS) OF FAT EXTRACTED FROM INFLATIONS BY STRONG CAUSTIC SODA.

	Before Treatment.	After Treatment. Grams.	Reduction.
1A	41.03	39.30	1.73
1B	41.05	39.50	1.55
1C	41.45	39.70	1.75
1D	42.20	40.80	1.40
		Average:	1.61
2A	41.70	39.00	2.70
2B	41.65	39.01	2.64
2C	42.50	40.05	2.45
2D	41.50	39.03	2.47
		Average:	2.57
3A	41.35	39.04	2.31
3B	41.47	39.00	2.47
3C	41.35	39.02	2.33
3D	41.00	39.00	2.00
		Average:	2.28
4A	42.20	39.03	3.70
4B	42.09	39.07	3.02
4C	42.12	39.06	3.06
4D	42.18	39.04	3.14
		Average:	3.23

Group 3.

Group 3 was cleaned in the morning with caustic soda similar to groups 1 and 2, but in the evenings after flushing with cold water the solution which followed consisted of a gallon of boiling water in which was dissolved about half a handful of washing soda. This was finally flushed out with another gallon of boiling water.

Group 4.

Group 4 was cleaned both morning and evening with a washing soda solution as used in the evenings for group 3—that is, cold water rinse first, then washing soda and boiling water, then finally boiling water rinse.

These cleaning methods were applied to the machine for nearly four months from August 2 until November 20, during which time the herd consisted of 35 cows. The inflations were then removed from the teat cups and dried, and each was carefully weighed. The length was also measured, as well as the diameter of the bulged portion which had developed at the part where it squeezed the cow's teats. The inflations were then kept as hot as possible (about 200 deg. F.) for three and a half hours in a strong solution of caustic soda, four teaspoons in two quarts of water, according to the method recommended by Dr. Moir (see "Journal of Agriculture," September, 1943). This method of extracting fat from the inflations is several thousand times as intense as the usual daily cleaning procedure because the caustic solution is so very much stronger and it is applied for hours instead of for a short period of about a minute. After removal from this strong caustic solution the inflations were thoroughly rinsed with very hot water to wash off the butter-fat soap which was produced. They were then allowed to dry before the final weighing and measuring.

Results of Trials.

The results given in the table show that the weight of fat extracted from the Group 1 inflations is definitely the lowest of all. From Group 2 the average amount is a shade higher than for Group 3, while from Group 4 most of all was extracted. In fact, the use of washing soda twice daily instead of caustic soda allowed the inflations to absorb twice as much fat. Washing soda is nearly two-thirds water, but even when a liberal amount is used, it does not provide a strong enough cleanser. The results show that the cleaning with caustic soda TWICE DAILY as applied to Group 1 was much the most efficient way to check the absorption of fat left on the surface of the rubber after milking.

The subsequent strong caustic treatment, besides extracting these weights of fat, also reduced the size of the inflations. Taking average figures, the Group 1 inflations were reduced in length by a shade more than one-sixteenth of an inch; Group 2 by two-sixteenths; Group 3 by a little more than two-sixteenths; while Group 4 was shortened by between three- and four-sixteenths. The bulge which had developed where the inflations squeezed the cow's teat was on the average reduced in the case of Group 1 by between two- and three-sixteenths of an inch; in Group 2 by five-sixteenths; in Group 3 by between three- and four-sixteenths; and in Group 4 by nearly four-sixteenths.

These results demonstrate clearly that the absorption of fat by the inflations is the cause of their increasing in length and circumference so that they become slack and do not milk as quickly or as efficiently.

More than 20 years of experience have shown that the best way to keep the inflations and other parts of a milking machine in good hygienic condition is to apply TWICE DAILY the caustic-soda-and-boiling-water method which is recommended in the Dairy Division's Bulletin No. 118. The conclusion to be drawn from the trial described is that this method is also the best to ensure that the inflations will give long and efficient use.

◆

Smooth, efficient milking is not possible with a machine which is faulty mechanically, and today, with the difficulty in getting skilled servicemen, the farmer himself has a further duty to undertake. "The Care of Milking Machines," Bulletin No. 207, is available free from offices of the Department of Agriculture, and offers to practical farmers hints on the kind of attention that will ensure smooth running of the milking machine.

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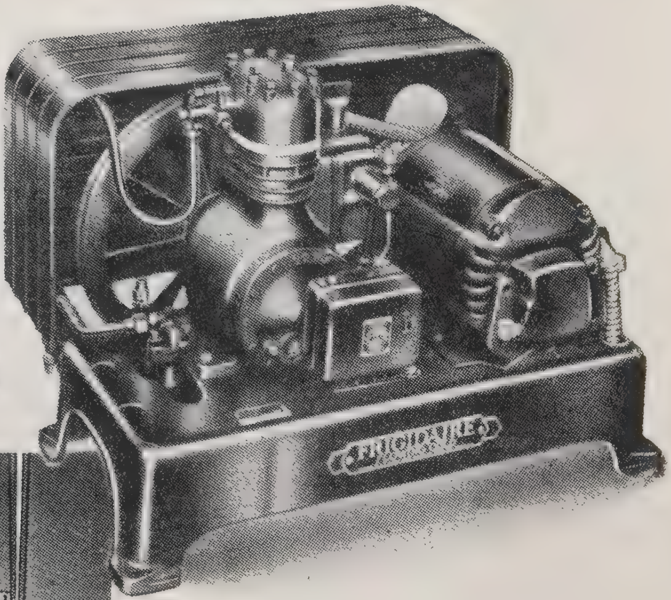

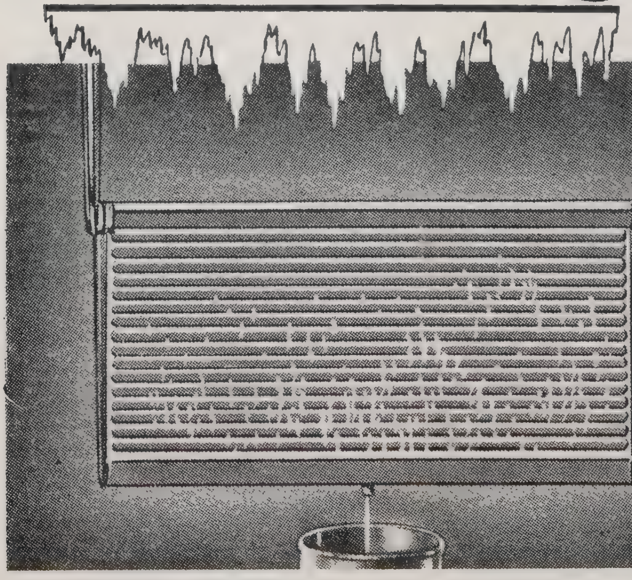

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Modified Method of Cleaning Milking Machines

Contributed by the
DAIRY DIVISION.

THE necessity for water being maintained at boiling point for cleansing milking machines has been clearly proved in Dr. Moir's article, but with the possibility of a reduction in the amount of electricity available, it may be necessary to adopt a modified method.

By the Electric Water Heating Order, 1943, all supply authorities in the Dominion are required to charge for all electric current used in water heaters on a unit basis. A recent survey covering 280 dairy water heaters showed:—

(1) That although the cylinders were not completely filled after the evening wash-up and the current was switched on all night, in very few was the water boiling next morning.

(2) That in order to reduce the charges for electricity the current was switched off during the day on many farms.

(3) That there was on these farms a deterioration in the quality of the milk and cream produced.

Although there has, up to the present, been no reduction in the amount of electricity which can be used for dairy water heating, provided the consumer is prepared to pay for what is used, the position may arise where a reduction becomes necessary. Should this happen, the following modifications of the cleaning methods recommended in the reprint of Bulletin No. 118 are suggested:—

(A.)

The amount of cold rinse water should be increased. It is impossible to use too great a quantity, but too little will result in milk being left in the milk pipes and consequently cooked on the surfaces by the boiling water which follows.

(B.)

The use of boiling water and caustic soda twice daily is essential if milking plants are to be kept thoroughly clean.

It should not be necessary to stress the merit of this method, as it has been amply tried and proved during the 30-odd years it has been in use. The condition of the milking plant where this system is followed and the quality of the resultant milk and cream delivered leave no room for argument.

There has been some argument with power board engineers regarding the necessity for water being up to boiling point because of the fact that water boils at 185 deg. F. in a milking machine working at a vacuum of 15 inches. This point is dealt with in Dr. Moir's article.

(C.)

Where, through the inefficiency of the cylinder or the element, boiling water is not available at both milkings when the cylinder has been filled to capacity, better results will be obtained if the amount of water added is reduced to the quantity which will ensure that it boils in the heating time available. With an efficient installation, the full cylinder of boiling water should be available at the morning wash-up, but it may be necessary to reduce the quantity added in the morning in order to obtain boiling water at night. Apart from the production of uncontaminated milk, the twice daily boiling water-caustic soda method has a very definite influence on the amount of fat absorbed by the milking machine rubberware, more especially the inflations and eleflator rubbers, which are subject to flexing. This feature is more fully dealt with in the article by Mr. J. M. Kristensen, Farm Dairy Instructor, Inglewood.

Experience has shown that a large quantity of hot water will not do the work of a small quantity of **boiling** water, which, due to its high temperature, will increase the efficiency of the caustic soda added. For that reason, it is preferable when the full quantity of boiling water is not available to use as a **minimum** one gallon of boiling solution followed by one-half gallon of boiling rinse water per set of teat-cups at **each** milking.

(D.)

Present indications are that, with the adoption of the unit system of charging for electric water heating, the cost to the farmer would be increased should the current be switched on for the full period between milkings. If such proves to be the case, the heater switch on an efficient cylinder can probably be turned off for up to four hours between the morning and evening milkings and still provide sufficient boiling water for use as described under **"C,"** but the water must be boiling and the twice daily system followed.

(E.)

A deposit of milk-stone in the milk pipe and releaser is due to:—

(1) Insufficient rinse water;

(2) Failure to use a tight-fitting brush or horse-hair ball in the overhead milk pipe;

(3) The use of hard water.

The first is dealt with in "A" of this article, the second on page 3, and the third on page 12 of Bulletin No. 118.

No apology is made for once more referring to the ncessity for the utmost care in the cleaning of milking machines and all dairy equipment, as there is a definite inclination to economise in the use of electric current for this purpose in areas where the unit system of charging has been installed. This can easily reach the point where the good reputation for keeping quality of our butter and cheese which has been built up over the years and maintained under war conditions could be lost.

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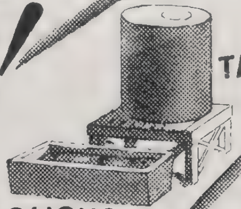

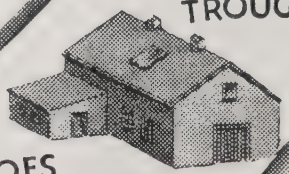

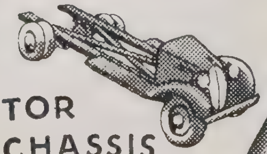

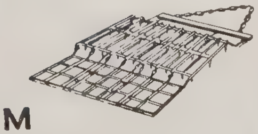

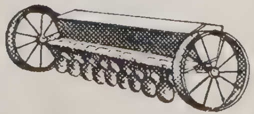

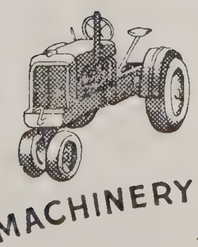

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FARMING IN NEW ZEALAND

Soil Management

THE Dominion's methods of soil management—in drainage and irrigation, in tillage methods and implements, in crop rotations and the use of lime, fertilisers, and animal manures—whilst having much in common with the practices in other temperate zones, have certain distinctive features which are worthy of description.

By

P. W. SMALLFIELD,

Director of the Fields Division, Wellington.

ARABLE mixed farming developed around the four- and six-horse teams, both units being so efficient in tillage work and economy of labour that they withstood tractor competition until quite recently, when the advent of the modern farm tractor and tractor tillage equipment gave mechanical power units a decided advantage over horses. The rapid rise of the tractor in recent years is illustrated in table XXVIII:

TABLE XXVIII—AGRICULTURAL TRACTORS.

Season.	*Area under annual crops and pastures cut for seed, hay and silage. (acres)*	*No. of Agricultural Tractors.*
1933-34	2,064,037	4,972
1934-35	1,981,804	5,062
1935-36	2,090,745	5,340
1936-37	1,918,855	5,710
1937-38	1,785,329	6,585
1938-39	1,807,445	8.031
1939-40	1,956,096	9,639
1940-41	2,048,198	11,278
1941-42	2,010,560	12,516
1942-43	1,911,833	13,967

The four-horse team (2-furrow plough) is capable of cropping 75 to 100 acres of heavy land or 100 to 150 acres of medium to light land in a year, whilst the six-horse team (3-furrow plough) can crop 150 acres of heavy land or 150 to 200 acres of medium land with the usual crop rotations of cereals and fodder crops, which allow fairly even distribution of team work throughout the year.

The common food for working horses is oaten chaff, and this is supplemented with whole or crushed oats, pasture, and pasture hay. The usual allowance is 5 tons of oaten chaff per horse per annum, but this quantity varies with the methods of feeding, supplements used, and amount of work performed. The usual ration for a working horse is 35lb. to 40lb. of oaten chaff per day, with a half or a third of this ration on idle days when the horses are out on pasture. The grain ration of a heavy working horse should be from 16lb. to 18lb. per day, and sufficient coarse fodder must be mixed with the grain to give bulk to the ration to aid digestion. The oaten chaff used for horse-feeding admirably serves the purpose. Oaten chaff from a 40 bushel crop of oats will consist of about 40 per cent. oats and 60 per cent. chaff; hence in feeding 40lb. chaff the horse receives 16lb. oats and 24lb. straw. The daily ration of oaten chaff is divided into five feeds; two are given in the morning, one at midday, and two at night. The horses are brought in from pasture for grooming and feeding at 5.30 a.m. to 6 a.m., worked a full 8 hours in the field, and turned out from the stable to pasture again at 8 p.m. to 8.30 p.m.

So long as the farm tractor was equipped only to pull implements designed for horses, the horse teams held their own at tillage work: they were equally efficient at heavy work, and their horse power being divisible they were more economical for light work such as horse-hoeing, mowing, reaping, etc. But with the advent of implements designed especially for tractor work, which enabled tractors to do all the work horses can do and do it more quickly and efficiently, the tractor is replacing the horse. The direct attachment of implements to tractors, the power take-off facilities, the elimination of the early and late attention to grooming and feeding horses are making the tractor the common power unit on mixed farms. At present the tractor has not entirely replaced the horse, but indications are that it will soon do so.

Crop Rotation

Arable mixed farming crop rotations, although somewhat elastic, are designed to fulfil certain very definite purposes, e.g., to maintain soil fertility, to provide the necessary root and green fodder crops for sheep feeding, to allow of the production of suitable cash crops, and to distribute team or tractor work as evenly as possible throughout the year.

In arable districts short and long rotation pastures form the basis of the farm economy. The pastures consist chiefly of perennial ryegrass and red and white clover, and provide pasturage for the ewe flock maintained for the production of fat lambs. During the period under grass (3 to 5 years) soil fertility is built up, and this build-up depends on the vigour of the clovers in the sward. In the lower-rainfall districts pasture production in the late summer, early autumn, and winter is insufficient for the requirements of the sheep, and supplementary feed of green fodder and roots has to be provided. Rape is used for the summer fattening of lambs, green cereals, kale, and chou moellier and soft turnips for autumn and early winter, and swedes and soft turnips for winter feeding. Cereals and pulse crops, potatoes and linen flax are grown in rotation with these rotation pastures and fodder crops,

CULTIVATION

In the early days of settlement bullocks were used to cultivate the land and haul produce and timber. They were easier to keep than horses, and for rough ploughing were much steadier. As farming developed horses replaced bullocks, and in the arable farming districts the four- and six-horse teams became the standard units.

These teams hitched with equalising blocks and chains and used with colonial three-wheeled ploughs are very efficient cultivation units. So long as the farm tractor was equipped to pull only implements designed for horses, the horse teams held their own at tillage work: they were equally efficient at heavy work and their horse power being divisible they were more economical for light work such as horse hoeing, mowing, and reaping.

But with the advent of implements designed especially for tractor work, which enabled tractors to do all the work horses can do, and do it more quickly and efficiently, the tractor is replacing the horse. The direct attachment of implements to tractors (inter-row cultivation equipment, etc.), the power take-off facilities, and the elimination of early and late attention to grooming and feeding are making the tractor the common power unit.

and a typical rotation on good cropping land is given below:—

- **Pasture—3 to 5 years.**
- **Wheat—Followed by a catch crop green cereal.**
- **Rape or turnips.**
- **Oats or barley—Grass seed sown with the spring cereal.**
- **Pasture—3 to 5 years.**

Instead of being cropped for 3 years the land may be kept under crop for 5 or 6 years: peas and potatoes may be taken after the first crop of wheat and be followed by a second wheat crop: rape may be the last crop of the rotation and the land sown back to grass in November with the rape, or, if a really satisfactory pasture is the aim, the grass may follow rape or turnips and be sown down early in the autumn after a summer fallow.

In the rotation quoted the wheat is autumn or early winter sown, and the initial preparation of the land either by skim ploughing or hustling commences after the turnip sowing is completed in December; then comes the harvesting of the cereals, followed by the sowing of a catch crop of oats or barley on the wheat stubble. This is followed by the working up of the wheat land and the drilling of the crop by the middle of June. Winter work consists of ploughing and cultivating the areas intended for spring cereals, and following the sowing of these crops in August and September the preparation of the seed-bed for rape, which is sown in November, and turnips, which are sown in December. Thus the team or tractor work is fairly evenly spread throughout the year, and the production of cash crops enables the arable farmer to provide the necessary fodder crops at a reasonable cost.

Grassland Farming

In the higher-rainfall districts almost complete reliance is placed on pastures, and the chief supplementary feeds are hay and silage saved from permanent pastures. In the far south, where winter conditions are severe, bulky root and forage crops have to be grown to carry the stock through the winter, and cropping is confined to roots and green fodder for winter feeding. A common rotation is:—

- **Pasture—7 to 10 years.**
- **Swedes.**
- **Oats—Pasture sown with oats.**
- **Pasture—7 to 10 years.**

Oats are produced for chaff and for milling; two years of forage cropping may be done instead of one, and swedes may be followed by chou moellier, owing to the danger of club root when two swede crops are grown in succession.

In the North Island cereal production is very restricted, and annual cropping is mainly confined to areas requiring pasture renewal, when a crop of roots is taken and the land resown to grass either in the spring or after a summer fallow.

Fertilisers and Lime

The use of fertilisers and lime is an important feature of the Dominion's crop and pasture production practices. Fertiliser imports are recorded as far back as 1867, and the practice of pasture topdressing commenced in the late eighties. The outstanding feature of fertiliser practice is the predominating importance of phosphatic fertilisers, and main features of fertiliser usage are shown in table XXVIII:—

TABLE XXVIII—FERTILISER USAGE.

Season.	*Super-phosphate (straight). (tons)*	*Other Phosphates. (tons)*	*Blood and Bone; Blood; Bone, etc. (tons)*	*Potash Sulp. Ammonia Nit. Soda. (tons)*	*Total. (tons)*
1928-29	275,488	151,249	24,746	13,701	465,184
1929-30	299,327	183,555	24,031	18,992	525,905
1930-31	234,220	125,266	25,340	17,814	402,640
1931-32	231,078	97,021	22,556	9,157	359,812
1932-33	307,224	59,480	26,115	10,513	403,332
1933-34	280,418	64,266	24,001	7,490	376,175
1934-35	313,924	25,305	23,021	11,178	373,428
1935-36	331,029	54,895	25,234	15,242	426,400
1936-37	370,178	92,337	25,338	15,027	502,880
1937-38	447,407	120,862	21,676	21,371	611,316
1938-39	461,572	107,291	23,535	21,990	614,388
1939-40	511,570	111,896	26,684	22,461	672,611
1940-41	598,529	58,534	29,846	11,748	698,657
1941-42	418,562	47,563	32,221	4,085	502,431
1942-43	294,935	27,374	34,828	5,194	362,331

Normally New Zealand supplies of rock phosphate for superphosphate manufacture come from Nauru and Ocean Islands, and production and distribution to fertiliser works were administered by the British Phosphate Commissioners, an organisation set up following World War I to distribute the phosphates from these mandated islands. Provision was made for Great Britain and Australia each to obtain 42 per cent. and New Zealand 16 per cent. of the total output. Great Britain, however, obtained her supplies from other sources, and Australia and New Zealand have shared the output from Nauru and Ocean Islands.

After the phosphate rock reaches New Zealand it goes to the fertiliser works; eight works manufacture superphosphate and one manufactures a heat-treated phosphate. The potential output of all works combined is in the vicinity of 600,000 tons annually.

In addition to rock phosphate for manufacturing superphosphate, New Zealand has always been an importer of rock phosphates for direct applica-

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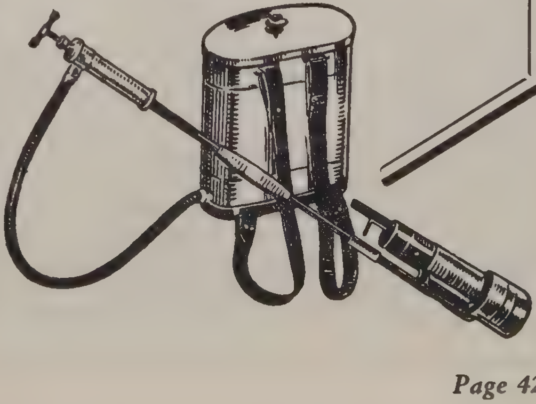

tion to the land, and has at times imported large quantities of basic slag. Phosphates for direct application to the land were imported from Seychelles, North Africa, and Walpole Island: basic slag was first imported in 1891, and imports increased to 30,000 tons in 1914; they ceased during the war, but rapidly increased again until in 1930 94,000 tons were imported, since when imports have declined and have ceased during World War II.

Blood and bone, blood, and bone-dust are by-products of the Dominion's meat industry, and they are used largely for market gardening and in mixtures for annual crops. Potassic and nitrogenous fertilisers are used to a limited extent only: potassic fertilisers are used for topdressing pastures in certain areas when the soil is deficient in potash and for special mixtures for annual crops. Nitrogenous fertilisers are mainly used by market gardeners and orchardists.

Pasture topdressing is a very important practice in the intensively-farmed areas, and table XXIX sets out the areas of grassland topdressed.

TABLE XXIX—AREA TOPDRESSED

Year ended January 31.	*Artificial Fertiliser only.*	*Lime only.*	*Fertiliser and Lime.*	*Total Area Topdressed.*
1927	1,409,789	106,995	4,475	1,521,259
1928	1,831,216	118,124	3,150	1,952,490
1929	2,531,530	223,373	2,966	2,757,869
1930	2,854,657	359,663	*	2,650,748
1931	2,432,438	438,878	*	2,871,316
1932	2,067,672	386,649	*	2,454,321
1933	1,741,035	102,952	594,127	2,438,114
1934	1,469,537	116,234	663,399	2,249,170
1935	1,703,325	145,986	834,803	2,684,114
1936	1,798,714	150,925	932,585	2,882,224
1937	2,122,386	176,763	1,027,130	3,326,279
1938	2,516,236	188,953	1,168,800	3,873,989
1939	2,584,618	218,445	1,213,881	4,016,944
1940	2,764,295	204,478	1,218,511	4,187,284
1941	2,923,378	250,972	1,474,967	4,649,317
1942	2,324,136	380,145	1,508,096	4,212,377
1943	1,574,786	570,847	1,324,422	3,470,055

* Not quoted for these years.

Approximately 600,000 tons of lime are used annually. All lime carried on the railways from lime-works to bona fide farmers in 6-ton lots or more is carried free for 100 miles. The normal freight which would be payable to the Railways Department is paid by the Department of Agriculture: thus any farmer up to 100 miles from a lime-works is able to obtain his lime at the "on trucks ex works" price.

Animal Manure

As livestock are not housed, the utilisation of farmyard manure is not an important feature of New Zealand farming. Stock droppings are returned direct to the land, and on dairy farms harrowing to spread droppings is a feature of pasture management. Some accumulations of manure occur at cow sheds, and of recent years progressive farmers have made provision to save all the manure and washings from the sheds and spread it on the pastures as liquid manure. Market gardeners are the main users of animal manure from stables and poultry and pig farms, and for intensive vegetable production manure of this nature seems to be essential.

Drainage

Farm drainage with open, tile, and mole drains has been an important factor in land improvement, and in recent years the extended use of mole

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drainage on suitable soils has improved production on large areas of pasture lands. Large areas of low-lying swamp land have been reclaimed by drainage schemes undertaken by the State; rivers have been stop-banked and straightened, and main drainage and subsidiary canals dug with dredges and the land roaded and prepared for settlement. Most of the reclaimed land has been used for grass farming.

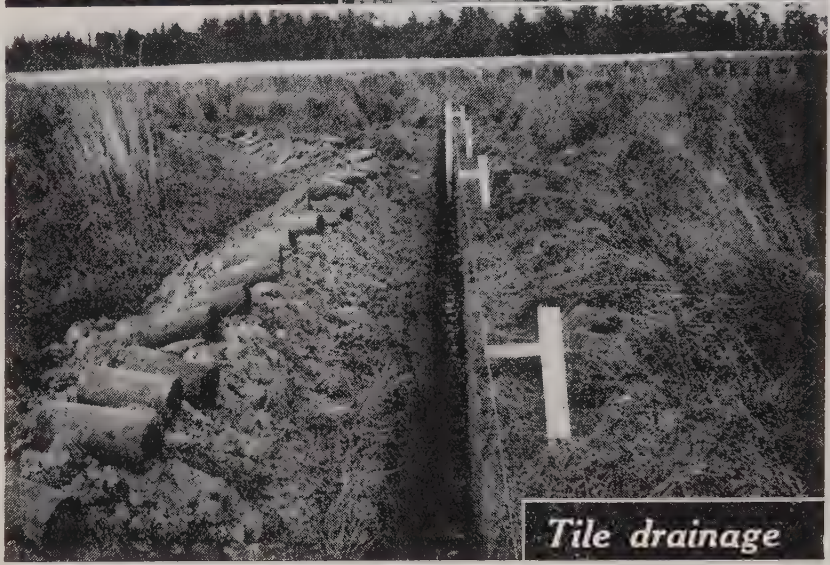
Difficulties have been experienced in the reclamation of certain areas of deep peat. Drainage has over-dried the peat, which, when thoroughly dry, does not readily re-wet, and after considerable expenditure on drainage work the reclaimed land is capable of supporting only an inferior sward. A different method of approaching the drainage problem by maintaining a high water level in the summer and lowering the water level in the winter would probably have given better results.

Irrigation

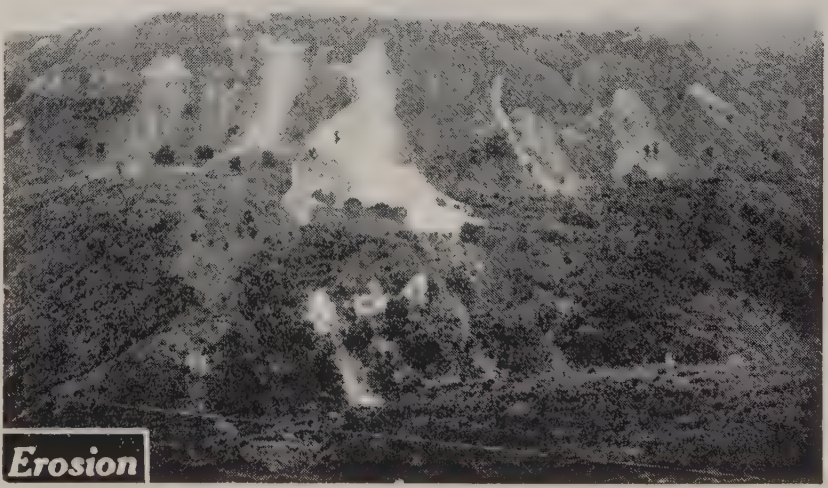
Irrigation started in the semi-arid region of Central Otago, where some of the water races constructed for gold mining were eventually used for irrigating crops. Gold in Central Otago was obtained by sluicing gravel in the riverbeds, and races to convey water to sluicing claims were constructed all over the country. After the passing of the gold boom a few miners remained in the district and turned their attention to vegetable and fruit production by the aid of irrigation. The results were quite successful, and a number of irrigation schemes were later established in Central Otago and provided reticulation for 80,000 acres. The main crops grown under irrigation there are pasture, lucerne, and fruit.

Two irrigation schemes have been completed in South Canterbury, namely, the Redcliff Scheme of 5,000 acres, and the Levels Scheme of 13,000 acres, while in Mid-Canterbury (Ashburton County) two other schemes are under construction. These are the Mayfield-Hinds Scheme of 82,000 acres, and the Ashburton-Lyndhurst Scheme of 68,000 acres. Other projected areas in Mid-Canterbury are Valetta (68,000 acres), Barrhill (52,000 acres), and Rakaia (132,000 acres). Preliminary work has also been undertaken with a scheme in the Marlborough Province. These schemes are in areas having an annual rainfall of 20-25in., and the irrigation is mainly intended for pasture production. There is no rate on the land, the farmer paying only for the actual water he uses at the rate of 7s 6d per 2-acre feet. Water is applied by wild flooding, border ditch, and border dike methods, encouragement being given to the last-named method by which the amount of water applied can be better controlled so that the optimum amount of 3-4in. per acre can be given

Swamp drainage



Tile drainage



Erosion

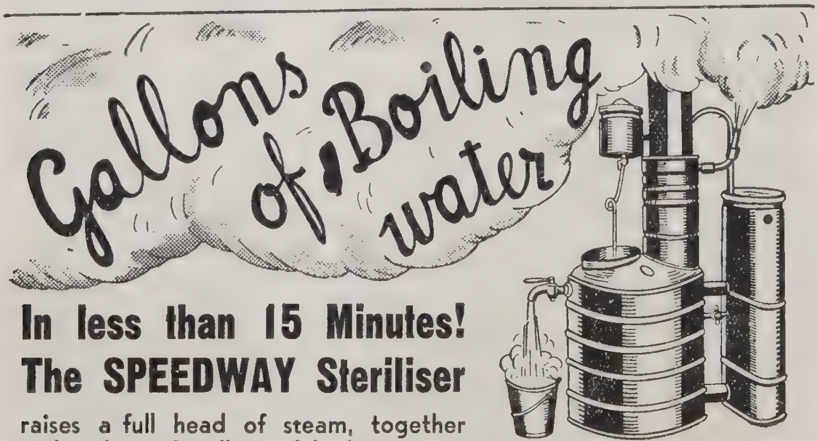
with each irrigation. Pasture irrigation ensures adequate grass growth during the dry summer and autumn weather, and when the schemes are fully operating will increase the meat, wool, and grass and clover seed production from the areas provided with irrigation facilities.

Erosion and Land Deterioration

New Zealand has certain serious problems in soil erosion and land deterioration. On the hill country in the higher-rainfall districts sheet and slip erosion and reversion to second growth have been the cause of serious land deterioration over many thousands of acres of surface-grown pasture land, whilst on the tussock hill grassland in the lower-rainfall areas land deterioration has been caused by depletion of the native vegetation through overgrazing and rabbits and burning and erosion.

Much of the surface-sown hill country consists of steep hills and mountains which were originally clothed in forest. The forest was felled and burnt, and pastures, established in the ashes of the forest fire, grew remarkably well for a number of years, when the carrying capacity declined as the plant food leached away and the surface soil eroded. Some areas in the very high-rainfall areas very quickly reverted to second growth of fern and manuka; on other areas the reversion was not as rapid, but the control of second growth by fire assisted sheet erosion and fertility has continued to fall as the surface soil has been washed away. When the stumps and roots of the original forest rotted away slip and gully erosion commenced, and this type of erosion threatens the stability of both the hill country farms and the farms on the flood plains of rivers having their catchment areas in eroded hill country. Heavy rains bring down increasing amounts of silt which are deposited on the plains during periods of flood. The control of erosion will necessitate the utilisation of large areas of hill country for forestry instead of farming, the improvement of the pasture swards on the less seriously eroded country by topdressing and controlled grazing, and the stop-banking of rivers liable to flood low-lying country.

To implement the control of erosion a Soil Conservation and Rivers Control Act was passed in 1941—"An Act to make Provision for the Conservation of Soil Resources and for the Prevention of Damage by Erosion and to make Better Provision with Respect to the Protection of Property from Damage by Floods." The Act sets up a Soil Conservation and Rivers Control Council, which is given the general control of soil erosion problems, and which will work through boards having control of river catchment areas. The boards are given wide powers in the control of land, and although little has been done during the war, a progressive policy to combat soil erosion should be established after the war.



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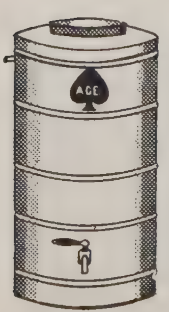

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Pig Industry Broadcasts

UNDER the auspices of District Pig Councils broadcasts will be delivered in December as follows:—

Auckland—1YA, on December 20, at 7.15 p.m., "Common Ailments," by C. Wallace, Supervisor, Waikato District Pig Council.

Palmerston North—2ZA, on December 19, at 8.30 p.m., "Bacon Production," by L. Marsdon, Supervisor, Wellington District Pig Council.

Dunedin—4YA, on December 11, at 7.15 p.m., "Common Ailments," by N. McDonald, Supervisor, Otago District Pig Council.

Napier—2YH, on December 14, at 7.30 p.m., "Pigs in Summer Time," by I. H. Owtram, Supervisor, Tairawhiti District Pig Council.

◆

Capacity of Dips, Dipping Troughs, etc.

Because of their irregular shape the measurement of the capacity of dips and dipping troughs is often difficult. A simple method is to fill them from a container of known capacity and either record the gallonage at the various levels on a dip stick, or permanently on the side of the dip or trough.

◆

Testing of Purebred Dairy Cows

Review of N.Z. Certificate-of-Record System in 1941-42-43

Contributed by the Dairy Division, Wellington.

IT HAS not been practicable during the past two years to publish in the Journal a statistical survey of the Certificate-of-Record testing results, and for record purposes we therefore include in the present survey figures for the calendar years 1941, 1942, and 1943. Because of the space required it is necessary to make the review very brief and to divide it into two sections. The Jersey breed is dealt with in this, the first section, while the Friesian and other breeds represented in the C.O.R. testing will be covered in a subsequent issue.

It was expected, and for what appeared good reasons, that entries would decline in number as the difficulties arising from the war increased, among these being the shortage of cattle foodstuffs, of fertilisers, and of the specialised type of labour necessary for the successful handling of pedigree dairy cows. This position, however, is not borne out by the figures. In the peak month, December, of 1941, there were 789 cows on test on the farms of 314 breeders. The 1942 figures showed the expected trend, falling to 284 breeders with 655 cows on test. In 1943, however, the position had fully recovered, and in December of that year there were 859 cows on test on the farms of 331 breeders. This compares more than favourably with the position immediately preceding the war, and the C.O.R. test is therefore numerically more than holding its own, despite wartime conditions.

Selected pedigree dairy stock has long since been recognised as the best foundation for the building up of dairy factory supply herds, and the pedigree breeder has therefore always played an important part in the advancement of our dairy industry. In normal times there has been a steady influx of fresh blood from overseas. Importation, however, has now ceased, and is not likely to be resumed until some years after the war. And even when transport is no longer a difficulty it would seem likely that all surplus stock in the countries from which New Zealand has been in the habit of importing will be needed to replenish the herds in countries devastated by war, so that the work of our breeders has never been more important than at present.

There have been many difficulties in the way of continuing the Certificate-of-Record testing, but every endeavour is being made to accept all entries offering and to maintain the standard of the service. For some years the average number of cows tested by each testing breeder has been less than three. The time and cost involved would be utilised to much better advantage if breeders would place more cows under C.O.R. and test all other cows in the herd under Government Official Herd Test.

While new heights of individual cow production are still being reached occasionally, the making of high records appears to be a novelty which is on the wane, and attention is now showing a tendency to focus on families and lifetime production. It is being recognised that there is more merit in a high and consistent average than in the acquisition of a class leadership by an odd animal which far exceeds in production ability the remainder of the herd. This is all to the good. There is also pleasing evidence that the long years of effort on the part of the principal breeders' associations to correlate type and production is meeting with success, and that show-ring type as distinct from proven production is attracting less attention. While, as yet, there is perhaps no conclusive proof that good type guarantees good production, evidence is accumulating to prove that high producers are usually of good dairy type, which would indicate that the accepted standards of type are sound.

"Lily Oak Golden Ringlet," tested by A. C. Smith, Tauranga, new three-year-old class leader in the 305-day division; age 3 years 313 days; 734.21lb. fat in 305 days; also highest three-year-old in the yearly division 1942; 840.45lb. fat.

[*"N.Z. Dairy Exporter" photo*]

The Certificate-of-Record test was commenced in 1912 and it is obvious that during the 31 complete years of testing which have elapsed since that date considerable information regarding the productive ability of our purebred dairy cattle has accumulated. This information should be invaluable to those who wisely select their testing entries with a long-distance breeding plan in view. A complete sequence of records from generation to generation is important, as production gaps in a pedigree tend to reduce its usefulness.

1.—C.O.R. YEARLY TEST DIVISION

During the 31 years between the commencement of the C.O.R. testing in 1912 and the end of 1943 first-class certificates of record in the yearly (365-day) division have been issued to 12,681 cows. Classified in breeds, 9,771 were allotted to Jerseys, 2,082 to Friesians, 517 to Milking Shorthorns, 233 to Ayrshires, 69 to Red Polls, 7 to Shorthorns, and 2 to Guernseys.

Table 1 provides a numerical summary of first-class certificates issued in the yearly division during the past three calendar years, while Table 2 provides a production summary over the same years according to breed.

TABLE 1.

CERTIFICATES ISSUED

Yearly Division

Breed.	1943. Ordinary.	 Repeat.	 Total.	1942. Ordinary.	 Repeat.	 Total.	1941. Ordinary.	 Repeat.	 Total.
Jersey	312	13	325	336	31	367	360	35	395
Friesian ..	22	5	27	47	6	53	48	2	50
Milking Shorthorn	1	2	3	5	—	5	10	1	11
Ayrshire ..	—	—	—	2	1	3	3	1	4
Totals ..	335	20	355	390	38	428	421	39	460

TABLE 2.

AVERAGE OF ALL FIRST CLASS C.O.R. ISSUED DURING 1943-42-41.

Yearly Division

1943—

Breed.	Certificates.	Average Yield for Season. Days.	 Milk (lb.)	 Fat (lb.)
Jersey	325	354	9293.1	525.40
Friesian	27	333	13,033.2	497.48
Milking Shorthorn ..	3	342	11,279.2	509.59
Ayrshire	—	—	—	—
Totals	355	352	9594.4	523.14
		Average Test: 5.45.		

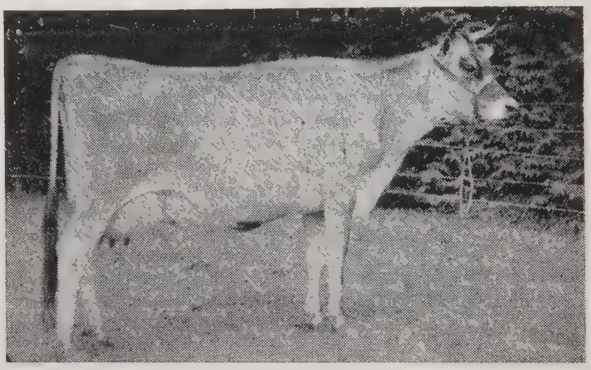
1942—

Breed.	Certificates.	Average Yield for Season. Days.	 Milk (lb.)	 Fat (lb.)
Jersey	367	355	9276.3	519.17
Friesian	53	352	14,603.3	537.13
Milking Shorthorn ..	5	350	10,656.6	460.61
Ayrshire	3	319	10,491.3	431.51
Totals	428	355	9960.6	520.10
		Average Test: 5.22.		

1941—

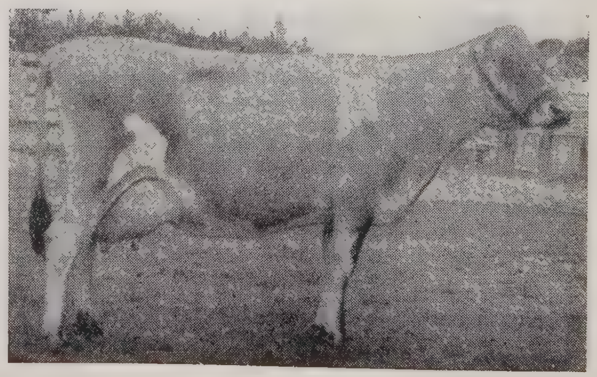
Breed.	Certificates.	Average Yield for Season. Days.	 Milk (lb.)	 Fat (lb.)
Jersey	395	354	9324.4	527.10
Friesian	50	350	14,569.0	543.18
Milking Shorthorn ..	11	347	9529.2	418.29
Ayrshire	4	318	11,417.3	461.93
Totals	460	353	9917.6	525.68
		Average Test: 5.30.		

Table 3 shows the position regarding second-class certificates issued during the three years under review.



"Green Meadows Queen," tested by T. W. Wardlaw, Waimana, new four-year-old class leader in the 305-day division; age 4 years 28 days; 731.02lb. fat in 305 days; also highest four-year-old in the yearly division for 1942; 826.30lb. ft.

["Farmer Weekly" photo]



Right.—**"Hupenui Opal," tested by C. W. Jensen, Waihakeke; highest Jersey for 1943; age 5 years 305 days; 909.50lb. fat in 365 days.**

["Farmer Weekly" photo]

TABLE 3.

CERTIFICATES ISSUED 1943-42-41.

Yearly (365-day) Division—Second Class

Breed.	1943. Ordinary.	 Repeat.	 Total Certificates.	1942. Ordinary.	 Repeat.	 Total Certificates.	1941. Ordinary.	 Repeat.	 Total Certificates.
Jersey	49	—	49	74	1	75	74	—	74
Friesian	16	—	16	5	1	6	14	—	14
Milking Shorthorn	—	—	—	2	—	2	—	—	—
Ayrshire	—	—	—	—	—	—	—	—	—
Red Poll and Shorthorn	—	—	—	—	—	—	—	—	—
Total	65	—	65	81	2	83	88	—	88

Period Between Calvings.

The rules governing the testing for first-class certificate allow up to 455 days between calving for commencement of test and calving subsequent to test. The average days between calvings for cows calving normally for first-class certificate in 1941 was 406 days, 407 days for those in 1942, and 405 days for 1943. It will thus be clear from these figures that the average cow for the three years had some seven weeks to spare.

Class Leaders

There has been no change in the class leadership records of the Jersey breed for several years, but for the information of readers we give in Table 4 the present position and in Table 5 the class leaders for 1943. There have, however, been some very creditable performances since our previous review, and some of the more outstanding performances, with an indication of their records, are shown in accompanying illustrations.

TABLE 4.

JERSEY CLASS LEADERS

Yearly (365-day) Division

Class & Name of Cow.	Owner.	Age	Standard.	Days in Milk.	Milk.	Fat.
		Yrs.Dys.	lb.		lb.	lb.
Jun. 2-yr.-old Beechlands Summer Lass	A. Moreland & Sons	1 343	275.5	365	15,467.2	899.25
Sen. 2-yr.-old Ashvale Dreaming Stella	J. & G. W. Dobson	2 350	310.5	365	12,689.1	815.73
Three-yr.-old Ivondale Silver Rainbow	P. J. Peterson	3 327	309.7	365	15,073.4	950.63
Four-yr.-old Woodlands Felicie	P. J. Peterson	4 364	384.9	365	17,332.6	1,220.89
Mature Holly Oak Annie	W. T. Williams	5 9	350.0	365	18,522.7	1,056.49

TABLE 5.

JERSEY CLASS LEADERS FOR THE YEAR 1943.

Yearly (365 day) Division

Class & Name of Cow.	Tested by	Age	Standard.	Days.	Milk	Fat
		Yrs.Dys.	lb.		lb.	lb.
Jun. 2-yr.-old Premier Royal Divinity	W. W. Dunn, Waihou	1 230	250.5	365	14,420.3	805.79
Sen. 2-yr.-old Greencroft Gracie's Girl	J. Bones, Kaipaki	2 355	311.0	365	11,301.5	751.88
Three-yr.-old Clara's Golden Cowslip	T. King, New Plymouth	3 361	348.1	365	11,788.1	773.98
Four-yr.-old Lily Oak Sunray	A. C. Smith, Tauranga	4 327	381.2	365	13,388.1	760.88
Mature Hupenui Opal	C. W. Jensen, Waihakeke	5 305	385.0	365	14,435.7	909.50

"Premier Royal Divinity," tested by W. W. Dunn, Waihou, highest junior two-year-old in the yearly division 1943; age 1 year 230 days; 805.79lb. fat in 365 days.

[*"Farmer Weekly" photo*]

"Sproston Idol," tested by Atkinson Bros., Inglewood, new junior two-year-old class leader in the 305-day division; age 2 years 11 days; 612.20lb. fat in 305 days.

[*"Farmer Weekly" photo*]

"Lily Oak Bright Ringlet," tested by A. C. Smith, Tauranga, highest three-year-old Jersey 1941; age 3 years 237 days; 913.43lb. fat in 365 days.

[*"Farmer Weekly" photo*]

Jersey Class Averages

Class averages for the Jersey breed for the calendar years 1941, 1942, and 1943 are shown in Table 6, while Table 7 shows the position from the commencement of the testing in 1912 to the end of each of those three years.

TABLE 6.

JERSEY CLASS AVERAGES—1943-42-41.

Yearly Division

Class.	Number of Cows.	Average Yield for Season.		
		Days in Milk.	Milk.	Butter-fat.
1943—			lb.	lb.
Junior two-year-old ..	114	358	8,431.6	477.70
Senior two-year-old ..	41	353	9,395.7	550.45
Three-year-old ..	57	349	9,260.0	526.52
Four-year-old ..	37	359	10,246.2	564.14
Mature	76	350	10,091.0	563.74
All cows ..	325	354	9,293.1	525.40
1942—				
Junior two-year-old ..	95	357	8,204.1	463.04
Senior two-year-old ..	52	357	8,681.6	482.31
Three-year-old ..	71	360	9,565.8	551.69
Four-year-old ..	56	350	9,741.6	545.46
Mature	93	353	10,203.0	556.46
All cows ..	367	355	9,276.3	519.17
1941—				
Junior two-year-old ..	132	354	8,041.9	458.67
Senior two-year-old ..	45	358	9,170.5	524.25
Three-year-old ..	68	355	9,643.3	551.60
Four-year-old ..	46	357	9,946.0	552.21
Mature	104	351	10,535.4	588.06
All cows ..	395	354	9,324.4	527.10

TABLE 7.

Table showing averages of all Jersey 1st Class C.O.R. Issued from commencement of C.O.R. testing to 31/12/43-42-41.

Yearly Division.

Class.	Number of Certificates.	Average Yield for Season.		
		Days in Milk.	Milk.	Butter-fat.
To end 1943.			lb.	lb.
Junior two-year-old ..	4,184	350	7,418.4	419.11
Senior two-year-old ..	1,190	348	8,612.6	462.69
Three-year-old	1,675	348	8,871.9	499.44
Four-year-old	1,186	349	9,443.4	528.85
Mature	2,645	348	9,759.5	539.70
All	10,880	349	8.562.7	477.52
Average Test: 5.57%				
To end 1942.				
Junior two-year-old ..	4,070	350	7,390.1	417.47
Senior two-year-old ..	1,149	348	8,584.6	459.56
Three-year-old	1,618	348	8,858.3	498.49
Four-year-old	1,149	349	9,417.6	527.71
Mature	2,569	348	9,749.7	538.99
All	10,555	349	8,540.2	476.05
Average Test: 5.57%				
To end 1941.				
Junior two-year-old ..	3,975	349	7,370.6	416.38
Senior two-year-old ..	1,097	348	8,580.0	458.48
Three-year-old	1,547	348	8,825.8	496.05
Four-year-old	1,093	349	9,401.0	526.80
Mature	2,476	348	9,732.6	538.33
All	10,188	349	8,513.7	474.49
Average Test: 5.57%				

Jersey C.O.R. Bulls

The bull register indicates that Jersey cows certificated to the end of 1943 represented 3,684 different sires, the numbers being 3,542 at the end of 1942 and 3,454 at the end

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of 1941. At the end of 1943 the number of C.O.R. bulls was 746, the numbers for 1942 and 1941 being 714 and 688 respectively.

Champion butterfat bulls totalled 73 at the end of 1943, 68 at the end of 1942, and 63 at the end of 1941. The qualifications for the champion butterfat bull (C.B.B.) class, which was inaugurated some years ago by the N.Z. Jersey Cattle Breeders' Association, are as follows:—Each bull must have five or more daughters which, under first-class C.O.R. conditions, have produced 520lb. fat if under three years of age when starting test, 580lb. when starting between three and four years of age, 640lb. when starting between four and five years of age, or 700lb. when five years of age or over. It is not necessary for each daughter to be from a different dam. The corresponding standards for cows in the 305-day division are 460lb., 510lb., 560lb., and 620lb. butterfat respectively.

2.—C.O.R. 305-DAY TEST DIVISION.

During 1943 some 78 Jersey cows were granted first-class certificates in the 305-day division of the testing. The corresponding numbers for 1942 and 1941 were 161 and 106, the position therefore evidencing considerable variation from year to year.

TABLE 8.

JERSEY CLASS AVERAGES FOR 1943-42-41.

305-Day Division

Class.	Number of Cows.	Average Yield for Season.		
		Days in Milk.	Milk.	Butter-fat.
1943—			lb.	lb.
Junior two-year-old ..	42	297	7,054.5	395.09
Senior two-year-old ..	19	296	7,714.5	411.40
Three-year-old ..	13	304	8,111.6	451.92
Four-year-old ..	13	300	8,829.6	489.89
Mature	20	295	8,959.2	490.66
All cows ..	106	298	7,852.4	433.35
1942—				
Junior two-year-old ..	54	300	6,763.1	384.31
Senior two-year-old ..	17	301	7,572.9	432.03
Three-year-old ..	31	301	8,530.9	475.51
Four-year-old ..	22	295	8,616.9	483.07
Mature	37	296	8,919.1	489.43
All cows ..	161	299	7,937.8	444.56
1941—				
Junior two-year-old ..	21	297	6,629.4	372.49
Senior two-year-old ..	9	305	8,670.0	487.62
Three-year-old ..	8	302	8,366.6	490.88
Four-year-old ..	12	299	8,953.4	474.54
Mature	28	299	8,770.4	508.89
All cows ..	78	300	8,169.1	462.58

"Alven Diamond," tested by Hamilton Allen, Te Awamutu; highest senior two-year-old in the 305-day division for 1943; age 2 years 350 days; 568.47lb. fat in 305 days.

["N.Z. Dairy Exporter" photo]

"Jersey Glen Constance," tested by F. V. Bryant, Mangatainoka, highest Jersey for 1942; age 9 years 364 days; 922.15lb. fat in 365 days.

["N.Z. Dairy Exporter" photo]

Tables 8 and 9 provide a numerical and production summary of the position, class by class, for the three years under review, and from the introduction of the 305-day division in 1930 to the end of each of the years under review.

TABLE 9.

Table Showing averages of all Jersey 1st Class C.O.R. Issued from commencement of C.O.R. testing to 31/12/43-42-41.

305-Day Division

Class.	Number of Certificates	Average Yield for Season.		
		Days in Milk.	Milk.	Butter-fat.
To end 1943.			lb.	lb.
Junior two-year-old ..	363	299	6,729.4	381.40
Senior two-year-old ..	106	299	7,931.7	435.34
Three-year-old ..	177	300	8,199.3	455.59
Four-year-old ..	121	298	8,625.1	480.97
Mature	216	298	8,982.4	495.32
All .. .. Average Test: 5.57%	983	299	7,852.1	437.86
To end 1942.				
Junior two-year-old ..	321	299	6,686.9	379.61
Senior two-year-old ..	87	300	7,979.1	440.57
Three-year-old ..	164	299	8,206.3	455.88
Four-year-old ..	108	298	8,600.5	479.90
Mature	196	299	8,984.7	495.79
All .. .. Average Test: 5.58%	876	299	7,849.7	438.30
To end 1941.				
Junior two-year-old ..	267	299	6,671.4	378.66
Senior two-year-old ..	70	299	8,077.8	442.64
Three-year-old ..	133	299	8,130.6	451.31
Four-year-old ..	86	298	8,596.3	479.09
Mature	159	299	9,000.0	497.27
All .. .. Average Test: 5.57%	715	299	7,829.9	436.89

Class Leaders

There have been changes in class leadership in three age classes since the publication of the previous list in June, 1941. In all three cases the previous record was increased by a creditable margin. In the junior two-year-old class Sproston Idol, owned and tested by Messrs. Atkinson Bros., with 612.20lb. fat, displaces Mr. W. D. Dron's Kass Goldie's Promise, with 591.16lb. fat. In the three-year-old class Lily Oak Golden Ringlet (711.51lb. fat), owned and tested by Mr. A. C. Smith, of Tauranga, assumes the leadership in place of Mr. F. Geck's Pukeroa Wheaten Wafer, with

TABLE 10.

JERSEY CLASS LEADERS

305-Day Division

Class & Name of Cow.	Owner.	Age.		Standard.	Days in Milk.	Milk.	fat.
		Yrs.	Dys.	lb.		lb.	Fat.
Jun. 2-yr.-old Sproston Idol	Atkinson Bros.	2	11	251.6	305	11,096.4	612.20
Sen. 2-yr.-old Ashvale Dreaming Stella	J. & G. W. Dobson	2	350	285.5	305	11,317.8	711.51
Three-yr.-old Lily Oak Golden Ringlet	A. C. Smith (Tauranga)	8	313	318.3	305	12,543.9	734.21
Four-yr.-old Green Meadows Queen	E. T. Williams	4	28	326.3	305	10,046.3	731.02
Mature Cyrilla's Twylish Girl	E. J. Clough	11	88	360.0	305	17,645.4	906.15

700.76lb. fat. Finally, in the four-year-old class, Mr. H. J. Kaye's Hatcliffe Lady Gay, with 664.49lb. fat, gives way to Mr. E. T. Williams's Green Meadows Queen, with 731.02lb. fat.

Class leaders to the end of 1943 are given in Table 10, while Table 11 gives particulars of the highest records for 1943.

Upper right.—"Springdale Pansy," tested by H. Wilson, Hastings; highest four-year-old in the 305-day division 1943; age 4 years 30 days; 665.47lb. fat in 305 days.
["Farmer Weekly" photo]

TABLE 11.

JERSEY CLASS LEADERS FOR THE YEAR 1943.

305-Day Division

Class & Name of Cow.	Tested by	Age.		Standard.	Days. in Milk.	Milk.	Fat
		Yrs.	Dys.	lb.		lb.	lb.
Jun. 2-yr.-old Sproston Idol	Atkinson Bros., Inglewood	2	11	251.6	305	11,096.4	612.20
Sen. 2-yr.-old Alven Diamond	H. Allen, Te Awamutu	2	350	285.5	305	10,927.1	568.47
Three-yr.-old Pinecrest Gold Coin	E. J. Clough, Inglewood	3	323	319.3	305	10,598.4	597.37
Four-yr.-old Springdale Pansy	H. Wilson, Hastings	4	30	326.5	305	10,840.0	665.47
Mature Brooklands Princess	T. W. Wardlaw, Waimana	8	33	360.0	305	12,874.6	698.39

NECA
SHEEP DRENCH

is an efficient Treatment for LIVER FLUKE and STOMACH and INTESTINAL WORMS.

NECA DRENCH is a combination of Carbon Tetrachloride with other valuable worm remedies, and with the addition of Tonic Ingredients.

Well known breeders write:—

"Neca is a splendid Drench. Sheep made wonderful improvement after dosing."

"Your drench is very good; I can recommend Neca with confidence."

¼ Gallon, 9/1; ½ Gallon, 15/10; 1 Gallon, 28/4.

COBALTISED N.C.A.
WORM DRENCH

is a treatment of proved value for STOMACH, INTESTINAL, TAPE and WIRE WORMS in Sheep and Lambs.

It is a well balanced combination of Copper Sulphate, Nicotine Sulphate, Arsenic and Cobalt, and is a Tonic as well as an efficient Worm Destroyer.

Price 8/7 for 672 lamb doses or 5/2 for 336.

For Efficient & Economical Worm Drenching alternate Neca Sheep Drench & Cobaltised N.C.A.

Neca Products are manufactured from the finest ingredients and under the supervision of skilled Veterinary Chemists.

Obtainable from Farmers' Co-op. Assns., from your merchant, or forwarded freight paid from the manufacturers

TINGEY & HUBBARD, LTD. VETERINARY CHEMISTS, FEILDING.

Flock House Farm of Instruction

Flock House Station, established in 1924 by the trustees of the N.Z. Sheepowners' Acknowledgment of Debt to British Seamen Fund for the training in agriculture of overseas boys, was acquired by the Government in February, 1937, and is now open to New Zealand boys of from 14½ to 18 years of age who have passed the necessary medical examination and are of good character.

The hostel buildings.

THE Station is situated in the Rangitikei County, nine miles from Bulls, near the mouth of the Rangitikei River.

General Aim

The general aim is to give an initial training in all branches of farming, make a boy self-reliant, instil a sense of responsibility, and generally to give him a decent outlook on farm life.

The term is for twelve months, and applicants may enter at any time of the year.

There is no fee, the only cost being that of the regulation clothing outfit, a list of which is given later.

Remuneration

Remuneration as set out hereunder is paid during the period of twelve months boys are at Flock House:—

Period.	Remuneration per Week.	Amount to be held in Savings Account per week.
For the 1st 3 months .	2/6	1/6
" " 2nd " " ..	5/-	3/6
" " 3rd " " ..	10/-	8/-
" " 4th " " ..	17/6	14/6

As will be seen, the bulk of the money is paid to the credit of a savings account which is opened on the boy's behalf when he is admitted, and only sufficient for pocket money is paid to him direct each week. Further, the advancement in remuneration of a trainee is at the discretion of the Manager, Flock House.

The Dutch barn and oat stacks.

The Department of Agriculture undertakes to find suitable employment for each boy on completion of his training.

Application for entry should be made to:—

The Director of the Fields Division,
Department of Agriculture,
P.O. Box 3004, Wellington, C1.

The property comprises approximately 8,000 acres lying between the Rangitikei River and the coast, and varies from rich alluvial flats along the river frontage to typical sand dune country along the coast. Approximately 6,000 acres are stocked, the balance being devoted to an afforestation scheme.

The property is farmed as far as practicable along commercial lines, due regard being given to the initial purpose of training.

Tuition is principally along practical lines, supplemented by lectures by the staff and officers of the Fields Division.

The farm buildings, tools, and implements are not other than would be found on any well-equipped property of similar size and farmed on intensive lines.

Livestock

Horses: Good-quality draughts are bred on the farm, and also suitable hacks.

Cattle: There is a herd of approximately 90 good-type Jerseys and the usual young stock. About 1,000 head of well-bred Aberdeen Angus cattle are run. These include a breeding herd of 350 cows. All steers are fattened on the property. A small stud herd is also kept.

Sheep: Approximately 9,000 sheep are wintered, including 6,500 ewes bred to Romney and Southdown rams, ewe lambs from the former being retained for replacements to the ewe flock, and wether lambs and Southdowns fattened.

Pigs: Purebred Berkshire sows are bred to the Tamworth, and all pigs fattened.

Accommodation

Trainees are accommodated in the hostel, a two-storied concrete building set in ideal surroundings. Dining rooms, etc., are situated in an up-to-date annexe, the whole being lit by electric light.

When off duty the boys are under the supervision of a housemaster, the domestic arrangements being in charge of a matron, who is a fully qualified nursing sister. The food is good and ample.

Recreation

This is under the direction of the housemaster, and is well catered for. There is a large recreation hall adjacent to the hostel, where a weekly cinema is held, and also dancing and indoor games. There is a good swimming bath, cricket and football field, and a nine-hole golf course.

Religious services are held every Sunday.

Rules and Regulations

Trainees must conform to the rules, which will be strictly enforced. Any wilful damage will be charged against the trainee concerned.

List of Clothing Required

Khaki shirts, 3*; denims (trousers), 3*; work coat, 1; oilskin, 1; work boots, 1 pair; towels, 3; grey shirts, 2*; grey trousers, 2*; pyjamas, 2*; singlets, 2; best shoes, 1 pair; sand shoes; bathers; pull-over; best sox; working sox, 6 pairs*; handkerchiefs, 6; laces, leather and cotton, 3 each; overcoat; best suit; hussif; boot outfit; brushes, hair, clothes, tooth; comb; pad and envelopes; ties; braces; belt; cap or hat; blankets, 2; rug, 1; sports coat; coat hangers; best shirts; gum boots, knee, have been found to be very useful. Items marked * will require renewing at end of about eight months. The work boots to be military type, not too heavily nailed.

Dagging.

Milking.

Harvesting.

Maize and Pumpkins for Pigs

Experimental Farm's Record Returns

THE increased returns obtained from their pigs since the introduction of maize and pumpkin cropping into farm practice, referred to as "a remarkable recovery" and "a farm record," are mentioned in the annual report for the year ended June 30, 1944, of the Northern Wairoa Experimental and Demonstration Farm Society (Inc.), an extract from which is quoted:—

"**Pigs.**—With an increase in dairy herd production increased skim milk supplies were available for pigs. These supplies, augmented with a minimum of purchased meals costing only £13 6s. 3d., plus farm-grown crops of maize and pumpkins, enabled a remarkable recovery to be made in this section. Some 49 pigs, all heavy baconers, were sold, and the net return from this section was £175 19s. 1d. This works out at £3 1s. 10d. per cow, a farm record. This is equivalent to 2.62d. per lb. of butterfat.

"As the growing of farm crops for pig feeding is recognised as of great importance in increasing pig production during the important increased food drive, and is being subsidised, mention may well be made here of the increased returns obtained since cropping of maize and pumpkins has been introduced into the farm practice. This is shown below:—

"The net return from the pigs has increased by an average of £73 11s. 6d. per annum.

"A team of four Tamworth X Berkshire baconer pigs was entered in the 1944 Tomoana Baconer Competition, held at Westfield on July 17, 1944. Average points scored per pig were 75¾, thus placing the entry fourth in the Northland section and thirteenth in the whole competition. These four pigs averaged 163lb. dressed weight, and the comments upon the results included: 'Quite the best performance for heavy-weight pigs. The feeding is a credit to the farm. Fat points are very high. Length is splendid. Balance very good for such heavy pigs.'

"After the skim milk supply went off in the autumn these pigs were finished on maize, pumpkins, grass, and meat meal.

"It is pleasing to know that the farm systems of breeding, feeding, and management will produce pigs which will score highly under the new standards for judging baconers."

Average of three years.	Before cropping.	After cropping introduced.
Pig flesh per 100lb. of butterfat ..	Under 40lb.	60—70lb.
Return per lb. of butterfat	1.38d.	2.46d.
Net return per cow	£1 9s. 7d.	£2 13s. 9d.

CHAFF

Good Bright Oaten Sheaf Coarse Cut

Fresh stocks have just arrived. This chaff is really good and is recommended with confidence. It is Clean and well bagged.

Due to constantly fluctuating prices, farmers are advised to write, asking for our current bedrock prices.

Order Direct from Wellington's Leading Grain and Produce Merchants.

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PIG CONCENTRATE

Try it on these recommendations:

> "BEFORE using your Tomoana Pig Concentrate no one could convince me that a mixture of barley meals and meat meal could be improved on. However, after some very careful trials I have satisfied myself that Tomoana Pig Concentrate, fed at the rate of ½ lb. to 1 lb. per day alone with skim milk is the almost perfect pig food. The mineral mixture it contains eliminated white scour on litters confined to their houses in the early spring and kept the pigs in perfect health. I am now a confirmed user of Tomoana Pig Concentrate from weaner to killing stage.
>
> J. G. FOWELL ('Moananui' Stud Farm, R.D. Howick)."

> "PLEASE send me another ton of your Tomoana Pig Concentrate. With the last ton I tried out a few pigs for weight-gain with as much whey as they would drink and one lb. of Concentrate per pig per day (costing landed here £14/5/- per ton—1.71d. per lb). First weighing averaged 137.25 lbs. live weight. Pigs were large Black and Berkshires. Weighed again in 14 days average 165.83—a gain of 28.58 lbs. per pig in 14 days, or over 2 lbs. per pig per day.
>
> H. BAKER (Turua, Hauraki Plains)."

THESE men have **proved** the value of Tomoana Pig Concentrate—proved that it pays handsomely to feed it, either with skim-milk or whey or any farm-produced food. Palatable, digestible, and packed full of nourishment, vitamins and minerals, Tomoana Pig Concentrate gives greater weight-gains than any other food supplement.

Today we can supply all your requirements. Use the form below to order a trial lot. As soon as you have proved its value, place your monthly order promptly to make sure that **you** have continuity of supplies.

TEAR OFF THIS ORDER FORM AND MAIL IT TO-DAY!

To MESSRS. W. & R. FLETCHER (N.Z.) LTD.,
Box 17, Auckland.

Please rail (or ship) .... 125 lb. bags (16 to ton) of Tomoana Pig Concentrate (£13/15/- per ton, f.o.r. Westfield, or f.o.b. Auckland).

Consign to ....(NAME)

....(DESTINATION)

A/C. ....(Name of Produce Merchant or Dairy Company).

Crops for Pigs

Outstanding Results on Waikato Farm

Farmers should take advantage of the £5 per acre subsidy on crops for pig feeding. Here is the experience of a Waikato farmer, which shows how annual cropping may be used to increase pig production.

THOUGH many farmers are aware that the judicious use of crops for pig feed can considerably increase net profits, they are often reluctant to launch a cropping programme without the conviction that comes from seeing the results of the experience of others. The force of example brought out in this article is all the more striking, because it is fully supported by unassailable records placed without restriction at the disposal of the writer. While the value of cropping for pigs is established beyond doubt in the minds of a great number of pig producers, a further incentive to undertake cropping as a means of expanding pig production for Britain is offered by the State subsidy of £5 per acre on crops for pigs.

"I have nothing to hide. Anyone can come and see how the pigs are run here, and there is no real reason why it can't be done on many other farms." This was the feeling expressed by the sharemilker, Mr. W. E. Reid, and backed up by the farm owner, a well-known and long-established settler in the Pukerimu district, Cambridge. "There is this, though," continued Mr. Reid, "it is not a bit of use expecting results if a man isn't keen and neglects his pigs. They must have adequate shelter, ample good food, and constant attention. If they get that, and with ordinary luck, there is money in pigs, but you have to put in the work."

The Layout

An inspection of the pig section of the farm is a treat for any pig fancier. Covering roughly 1½ acres are 26 subdivisions on which there are 11 double-unit 18 x 9 pig houses and three single-unit huts. The fencing is almost wholly pig netting, wire fencing being out of favour because of the difficulty of shifting and the scratches on the pigs caused by the barbed wire. The shelters are iron roofed, with wooden floors well off the ground, and draught proof. This is brought about partly by sacking hanging down over the entrance to within a foot of the floor and steeped with oil as a prevention against ticks. Inside is a restricted quantity of hay, which keeps the pigs cosy, but is insufficient to hamper the movements of the small pigs. The entire layout is divided by a 15ft. drive allowing ample room to drive the truck between the whey drums. Outstanding amongst the features of this layout is the use of a large quantity of fine shingle from a nearby pit opened specially for the job. Not only is the main drive shingled to a depth of a foot, but almost all the pens are covered for about 20ft. back to provide a warm, dry area for the troughs and to reduce mud to a minimum. A comparison with the few pens not yet shingled shows striking advantages in general cleanliness and preservation of the pasture. It is needless to remark on the value of this or to say that the remaining pens are listed for shingling at the first opportunity.

By
A. T. SHANNON,
Field Economist, Hamilton.

However well ordered may be the layout, it is the results that count most. Here is the visual evidence on August 13. Ten of the 20 sows had farrowed, their litters being about six weeks old, and healthier, more thrifty piglets it would be hard to find, with not a runt amongst them. The litter sizes were: 1 of 4 pigs, 3 of 7 each, 2 of 8 each, 1 of 9, 3 of 10 each, total 80 pigs from 10 sows, an average of 8 pigs per litter. All these sows and those yet to farrow are in excellent condition, revealing careful husbandry and controlled feeding. What is even more appealing is that in the 1943-44 period net sales returns, less costs of purchased meal and incidental costs, show a profit of almost £400, and this is on whey feeding from 140 milking cows. Admittedly there are several special circumstances, but obviously this high level of returns invites a searching investigation for the benefit of other pig producers, and in setting out the following account unprepared documentary evidence has been drawn on to the full, principally figures on which income tax returns have been based.

"I have always been keen on pigs," said Mr. Reid, "and my experience of maize growing on the east coast and what I have read and seen of crops suitable for pigs made me feel there was a good thing in pigs if the crops and feeding were taken on in the right way." The co-operation of the farmer was secured and a layout constructed as an early part of the plant. In 1942-43 6 acres of old pasture were set aside for pig crops, comprising sugar beet, maize, kumikumi, swedes, and mangolds.

A few facts about the construction and costs of the layout should be of value. The plant has been built over a period of four years, so that costs are on a pre-war basis. For an 18 x 9 double-unit pig house the requirements were: Timber £11, roofing iron £4 10s., incidentals 10s, total £16. At the present time one would expect costs to run out about £20, with a roofing iron substitute. In addition, posts, battens, and pig netting for a double-unit layout would approximate £20. These prices, of course, do not include labour costs, and account only for materials. Pens are 15yds. wide and 30yds. deep, and with the ample allowance of shingle at one end afford a pleasant contrast with the heavy churned mud commonly found with pig-sties in the Waikato at the present time after heavy rain.

Cropping Pays

Discussing cropping, Mr. Reid commented, "I know that some farmers question the wisdom of growing crops for pigs on the grounds that more profit can be made by carrying cows than by reducing the herd to have several acres in pig crops. That isn't supported by facts. In the first place you plough your worst pasture that will be improved by regrassing after the crops. Also, you can count on leaving the land under cultivation for at least one season and you may get more.

"Now that the £5 per acre subsidy is available that is a real contribution towards the cost of regrassing under those conditions. When you put an area into pig crops it reduces the grazing for cows, although what actually happens is that the cows get half the crops grown for pigs, thereby improving the balance of the winter feed for cows, which more than compensates the loss of grazing by a cropping programme, anyway; you can easily work out the value of the butterfat production lost for those acres. I find I can get more profit by growing crops for pigs after deducting all costs."

The Money Side

A particularly informative comparison between results before and after the extended use of crops and the introduction of the new pig policy is afforded by the following figures showing how the pigs were sold in the seasons under review and what the net sales returns amounted to.

			1942-43.				1943-44.	
Baconers ..	26	103	9	0	136	516	0	10
Stores ..	52	97	3	6	32	82	8	5
Weaners ..	57	80	10	6	20	24	9	9
Boars ..	3	9	3	6	6	35	2	6
Sows ..					4	40	18	9
Choppers ..	4	18	19	6	4	15	7	3
	142	£309	6	0	202	£714	7	6

It will be seen how production has been concentrated in the second season on heavier weights, with greater returns in consequence. Even the stores sold were heavier, and were, of course, suitable for buttermilk fatteners. A very noticeable feature is the reduction in the number of pigs marketed as weaners, which in both seasons were got away in August and September, but in 1943-44 an adequate feed supply made it possible to hold the majority of them until fat. It will be noted that the particular care and attention devoted to raising breeding stock for sales has been rewarded.

In order to afford a further comparison between the two seasons it can be mentioned here that the costs of purchased meals were £218 14s. 4d. and £293 14s. 10d. in the respective seasons, leaving a balance of £90 11s. 8d. for 1942-43 and £420 12s. 8d. for 1943-44. It is interesting at this point to carry the analysis to a further stage where allowances can be made for such items as:—

1. Additional credits to each season where stock which would otherwise have been sold has been held over for breeding.
2. Costs of meal bought.
3. Costs of store pigs bought.
4. Costs of cropping—seed, manures, etc., as detailed.
5. Allowance for reduced cow grazing. Though there were 6 acres in 1943-44 as compared with 2 in the previous season, the loss in money was not proportionately as great, due to the bad season reducing the butterfat production per acre very considerably. While admittedly the comparison is not complete, it does provide a basis on which many farmers are at present debating with themselves the facts for and against cropping.

A "CHAMPION" IDEA, JEAN!

It's an excellent idea for young people to interest themselves in the rearing of calves and the formation of Calf Clubs in the various schools . . . and it was an excellent idea Jean Jonson, of Karakariki, had when she placed her pet on SERVICE CALF MEAL, because the Waikato A. & P. Association judged it the CHAMPION OF CHAMPIONS at their Summer Show.

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A crib filled with maize cobs is the pig farmer's best insurance against feed shortage.

	1942-43.		1943-44.	
	£	£	£	£
Returns from sales	309		714	
Plus pigs kept over for breeding ..	20		35	
	—	329	—	749
Less costs of meal bought ..	218		292	
Store pigs bought			28	
Crop costs (cash)	4		13	
Allowance for reduced grazing.				
	—	222	49	382
Net returns ..		£107		£367

When it came to the question of cropping costs the farmer pointed out that, apart from the purchase of a scarifier and ridger, it had not been necessary to incur any additional capital expenditure for cropping. That was the position on almost any farm. Recently a tractor had been purchased, but horses only had been used for cultivating the 6 acres of crops fed in the 1943-44 season. In consequence the cash costs incurred in cropping could be estimated as follows:—

	Acres.	Seed Costs.			Fertiliser.			Total.		
		£	s.	d.	£	s.	d.	£	s.	d.
Sugar beet .	1½	1	17	6	1	15	9	3	13	3
Mangolds ..	1	1	0	0	1	6	6	2	6	6
Maize ..	1½	1	13	9	1	15	9	3	9	6
Kumikumi .	1	1	0	0	1	6	6	2	6	6
Swedes ..	1		5	3	1	6	6	1	11	9
	6	£5	16	6	£7	11	0	£13	7	6

"Normally this land will stand cropping for only two years," it was pointed out. "After that the weeds come in heavily. Last year was very bad for weeds, and now most of the cropping area will have to go down into grass. The sugar beet, mangolds, and swedes will be sown on land broken up from old pasture. Only maize and pumpkins will be grown in land under crop last year. I have been cropping on the loamy soil on the farm, and my advice is to plough not later than August, leave for about a month, and then cultivate well. You can't work this soil too much. Then roll before sowing."

Cropping Programme

Here are the details in connection with the cropping programme:—

Sugar beet: This is sown not later than October 20 at the rate of 5lb. per acre, in ridges 27in. apart. The opinion was expressed that it is probably better to use the drill than the ridger, because using the scarifier between ridges tends to undermine the plants. Time permitting, it is advisable to thin out the plants to 3-4in. apart and to use the scarifier three to four times until the crop can beat the weeds. Experience has shown the value of the tops as a green fodder, the pigs preferring these to the roots. Compared with mangolds, sugar beet is a better crop for pigs—the stock thrives and finds the beet palatable. Sugar beet can be fed out at any time after maturity, but are used on this farm from the end of May until July, though if sufficient were on hand, it could be made good use of until the end of August. Last year the heavy weed growth reduced the weight of the crop.

Mangolds: These are sown in ridges in October and cultivated the same as the beet. They cannot be used until ripe and must, of course, be pitted for six weeks to avoid poisoning the stock. Pitting in July requires additional labour, which is one of their least satisfactory features as a pig crop. The pit is 9ft. wide, with earth sides 3ft. to 3ft. 6in. high, and the mangolds are bedded on hay. Three to four inches of hay is put on top and the pit covered with corrugated iron as it comes off the haystacks. In consequence of the pitting it is nearly August before the mangolds can be fed out.

Maize: Sown in October at 20lb. to the acre, this crop has so far avoided frost damage. Ridged in 27in. rows, maize requires scarifying at least twice, and thinning to about a foot between plants. The cobs are pulled in suitable weather in April-May and cribbed, using labour on the farm. Maize is used principally as a reserve, particularly to top off the pigs as baconers, from about August on. As required the maize is put through a stripper and fed out on the ground to make pigs chew the grain. If fed in the trough, much of the maize is swallowed whole and passes through the pig undigested.

Kumikumi: Drilled in December with swedes, no subsequent cultivation is required. Kumikumi do not stand up well to storing, particularly if frosted, and so are full fed to all classes of pigs in May, June, and July. It is considered that cattle pumpkins are a better crop from the point of view of the feed value, and they have been grown as a crop on their own, being planted in 6ft. squares, fertilised with superphosphate and blood and bone, and cultivated between the plants with the scarifier. These pumpkins have proved to be a really good standby.

Swedes: The feeling is that swedes are the least satisfactory crop for pigs and act mainly as a filler. Consequently they are not extensively used on this farm. Pigs show a definite distaste for them when other crops or meals are available.

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The general practice in feeding crops is to commence with sugar beet as the milk whey supply falls off, carting up to four loads on the konaki each day. Pumpkins and kumikumi come into the feeding about the end of May, carted in a waggon from the paddock and fed in the layout on the shingled part of the pens. Swedes are full fed in July and early August, followed by sugar beet and maize. A comparison of crops in trial feeding on this farm has convinced the farmer that sugar beet is the best root crop.

It is now proposed to expand the pig section still further by adding two double units and one single unit. In addition 3 acres will be suitably fenced and wholly devoted to pig grazing, there being a strong objection to having the pigs wandering at liberty over the cow pastures. This grazing will be made available to the dry sows, which will be brought in for farrowing and replaced by large stores. In a short time it is planned to have 10 acres in pig crops, including 2 acres of artichokes and an acre of silver beet. The mangold crop will be smaller. The idea is to graze off the artichokes so that no labour will be involved in feeding them, and the silver beet is to be kept as a spring feed.

Feeding Plan

Substantial amounts of meal, summarised as follows, have also been fed in the past season:—

	£	s.	d.
Meat meal	189	5	3
Maize	83	17	3
Molasses	6	10	9
Barley	1	11	2
Peanut meal		10	0
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The present plan is to develop farm crops to the extent that they eliminate all purchased maize and barley meals, and effect a considerable cash saving. It is considered too expensive to feed such purchased meals in comparison with meat meal and home-grown crops, except that at times there has been a shortage of meat

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meal. As a general policy meal is fed with whey to all pigs, varying with the supply of other food available and the necessity of topping off stores. Molasses constitute a good winter standby for whey or skim milk, being mixed with water and fed out for about three months.

"It is impossible to lay down hard-and-fast rules in pig feeding," Mr. Reid explained; "it all varies according to how you have to sell your pigs. You have to watch your costs, the supply of whey, the number of pigs on hand, and the market to decide what you are going to do from time to time. With winter feed supplies the whey man can often turn his pigs off most profitably as large stores to be fattened on skim milk, but it depends on the market a lot."

In 1944 production has been favoured by an additional supply of dairy by-product secured from a factory on a basis not involving any cash costs. This has amounted to an average of about 5 cans of whey per day during the dairy season to augment the supply from the 140 cows on the farm. In the past winter, mainly in June and July, about 6 cans of separated milk have been available every second day from the same source

Excluding pigs sold as sows, boars, and choppers, the net sales returns from 89 pigs carried through the winter of 1943 amounted to £346. Those carried through the winter of 1944 have netted £397 16s. and 7 sows and 5 boars remain on hand. In August there were 20 sows on hand, 16 of them Canadian Berkshire, 2 Duroc, and 2 Large White. It is proposed to experiment with the Duroc and Canadian Berkshire cross to see how they measure up to export requirements.

"You must have good sows," Mr. Reid said. "Farmers know they have to have good cows, why not good sows? The same applies to boars. You have to feed cows right to get the results and that goes for pigs too, yet you sometimes see a man with plenty of hay, silage, and crops for his cows in the winter while the pigs starve. If everyone was as particular about pigs as they are about cows, production and profits would be much greater.

"The co-operation of the farmer is very necessary, because you must have a good layout and finance to build it. If a share-milker has that it's up to him for his own benefit and not many would fail to respond."

It would not be proper to conclude this account without paying a tribute to the thorough manner in which the use of crops and meal has been planned and executed, especially in view of what was at the time a pioneer undertaking. As an example of the enthusiasm obvious to a visitor one might instance a book kept recording all manner of information concerning the sows—their earmarks, breeding and origin, date of services, the number in the litter, and the number weaned. Not only has the venture been a financial success, but every satisfaction has been gained from the fact that for several years the only loss from disease has been a partial carcase condemnation, but never a death.

The evidence on this farm would absolutely recommend the use of pig crops to any farmer prepared to work along similar lines.

The illustrations on this page show the general layout of Mr. Reid's piggery and some of the stock and feeding methods. In the general layout note the double-unit houses and the method of avoiding mud by spreading gravel in each pen 20ft. back from the central race.

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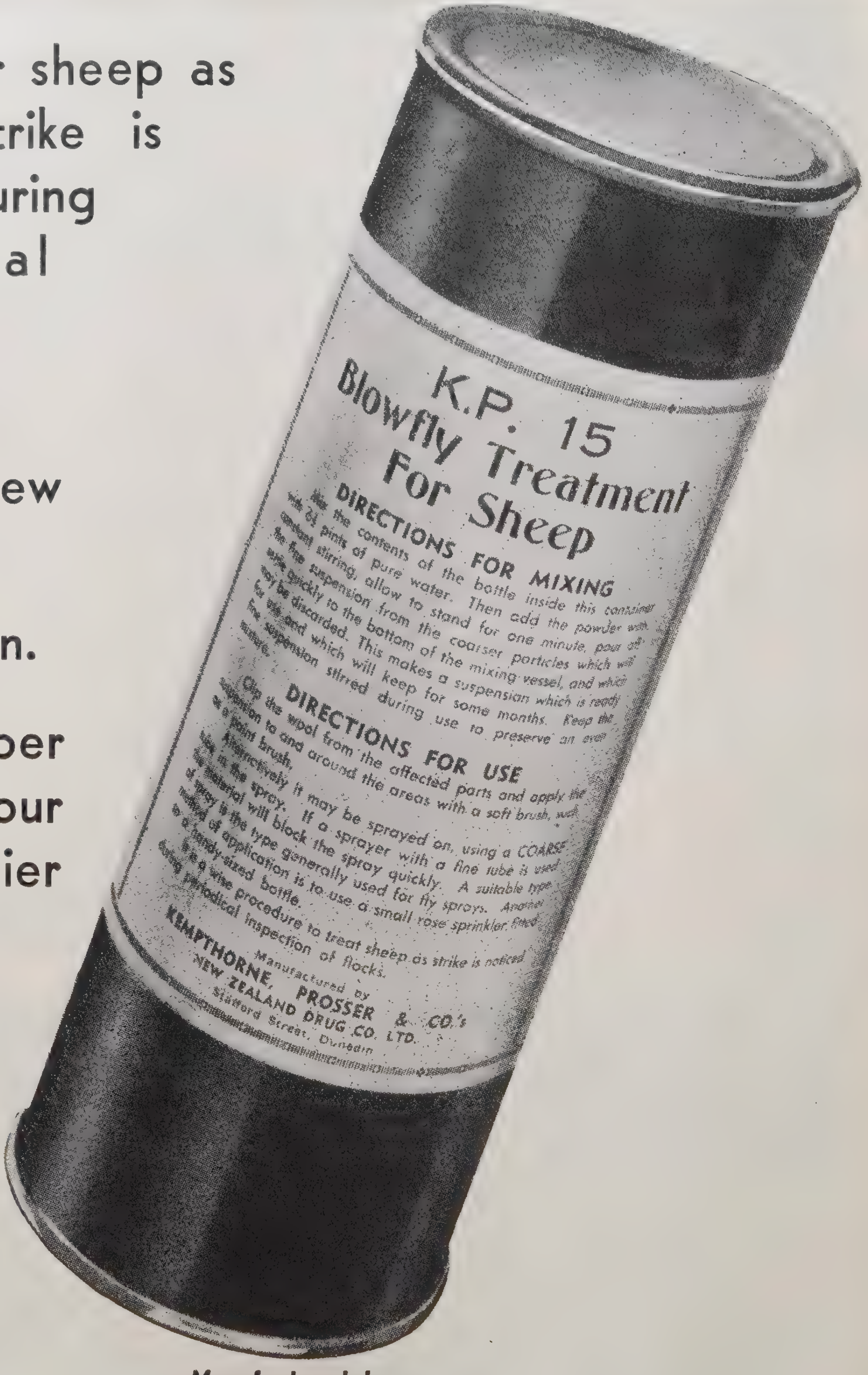
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SHEARING

— By —

J. H. HITCHCOCK,

Fields Instructor, Patumahoe.

SHEARING is a phase of farming activity in New Zealand the end of which is signalled by most people concerned with a big sigh of relief. As shearing time approaches the farmer is, of course, exceptionally busy, what with dagging and that last-minute rush to do those odd jobs around the shed and yards he meant to do after last crutching, but somehow didn't manage. The farmer's wife is, however, even more busy, as it is on the catering side that so much is required just prior to shearing.

THIS article has been written for the benefit of the man who is not a shearer, but who would like to become one. He will find shearing full of pitfalls, and to be a successful shearer he must be prepared above all to listen and learn from experienced men. He must also have a back made of rubber, and a heart of cast iron.

The need to-day is particularly urgent for shearers, and although it is only by practical experience one can ever become a shearer, this short article may give anyone interested some idea of what lies in front of him, and the main essentials necessary to master before one can claim to be a shearer.

Shed Apprenticeship

A large number of shearers serve their apprenticeship as shed hands, and it is necessary to know and be familiar with the atmosphere of a shearing shed before any attempt at shearing is made. By observation one learns the rudiments of the job, and then the first step, perhaps, is to be able to shear the last side for one of the shearers when the bell has gone. So a shearer is born, and perhaps by the end of the first season he has become used to the feel of the handpiece and, given the time, could shear a sheep reasonably well.

Perhaps two or three seasons may have to be spent as shed hands to be able to get enough practice to enable one to secure a learner's pen. If possible an attempt at crutching is an advantage for a man not familiar with either handpiece or sheep, as, although it is hard work, it enables one to get used to the feel of a handpiece and also used to handling and holding sheep.

There is a fascination about shearing, and although many a shearer has said, "This is my last season," yet the following season sees him shearing again and out to do a little better than he has done in previous seasons. It is one of the few jobs where so little time is purposely lost and where a man's energy and attention are fully extended from the commencement to the end of the run.

To the layman shearing looks easy, and it is not until he has tried it and finds himself, sheep, fleece, and handpiece all tied up together on the board and calling for a "rousy" to pull his machine out of gear that he realises it is not as easy as it looked. If one is prepared, however, to listen and to be shown, and to endeavour to apply what has been shown, it does not take long to grasp the fundamental principles of shearing, although it may take several seasons to master them. After commencing you will find yourself crawling off to bed done in and wondering whatever you saw in such a back-breaking, intricate job. At 4 o'clock next morning, however, you will be ready and determined that you are going to take that "belly" off a little faster this time, or that on your long blow you are going to fill your comb fuller and cut less air and so save yourself an extra blow or two.

Attention to Gear

Prior to commencing shearing a shearer will spend some time on overhauling his shearing gear. His handpiece will receive his first attention, and although handpieces are available in shearing sheds as part of the equipment, most men prefer to carry their own. With the modern handpiece very little is required in the way of maintenance, excepting, perhaps, new cutter pins, or, in the case of automatic forks, new tips. Most attention will be given to the combs, as these require much time and labour spent on them before a shearer is satisfied that they will "cut."

To the inexperienced a new comb looks as if it should shear without any further attention. Such, however, is not the case, and a lot of careful work is needed before a comb is considered right. It is a common sight to see a shearer with a comb, table knife, and emery paper or a comb stone working on a comb during "smoke-o" or in the evenings to bring these points of the comb up to a degree of perfection which will enable it to lead into the wool with the minimum of effort. It is recognised that two hours is generally necessary to bring a new comb up to the right pitch of perfection. Some shearers, however, carry a small machine which enables them to trim the comb points in less time than this.

Combs are given a lot of attention, as they cause more trouble than most other parts of a shearer's equipment. A shearer's lamb combs are treasured articles, and a good lamb comb broken is the cause of much anguish. A good lamb comb is one which has had much labour spent on the points, is probably at least half worn, and will in consequence lead into the dense points of the lamb fleece easily.

Cutters, although not requiring the work necessary for combs, are usually backed when new, and this tends for sweeter cutting.

Grinding

The grinding of combs and cutters is one of the most important phases of shearing, and this is generally done by an expert—the owner of the shed perhaps, or one of the shearers.

Grinding should never be attempted unless the correct technique is thoroughly understood. Briefly, grinding of gear is to sharpen combs and cutters with the minimum of wear to both comb and cutter. For successful grinding the emery papers must not be worn, and for a 4-stand shed a change of emery paper is necessary after a maximum of two days' grinding. A daily change is preferable, however; worn paper will polish but not sharpen your gear. To grind successfully the operator must not be too heavy in the hand.

Excessive grinding, particularly in the case of the new chum, may be obviated by ensuring that after finishing each sheep a squirt of oil is given to the handpiece and across the face of the comb and cutter. Also under no circumstances should you dip your handpiece into the water pot to clean off your comb while shearing. Water has an appreciable dulling action on your comb and cutter, so use only the dry brush for cleaning off the back of your comb. It is also not good practice to leave your comb on the handpiece too long before changing. Here again it is a matter of condition, but generally the comb should be changed at the end of every run, even if it is still cutting well. Excessive use of a comb means excessive grinding to sharpen it again.

Grinding is not a job for the new chum, but, as shearers do not as a general rule have to do their own grinding, he will not have to worry about this phase of the work.

The speed of the overhead gear is of importance both to good shearing and to the amount of grinding necessary, and 600 revolutions per minute is generally sufficient for ordinary shearing purposes, but for a fast gang it can with advantage be increased to 630—640 revolutions per minute to enable the faster men to drive their machines with ease.

It is sometimes said, "Shearers are born, not made," and there is probably some truth in that, but a man keen to learn and prepared to listen and obey instructions can generally develop into a first-class shearer. I know a shearer who did not have the opportunity to take up shearing till

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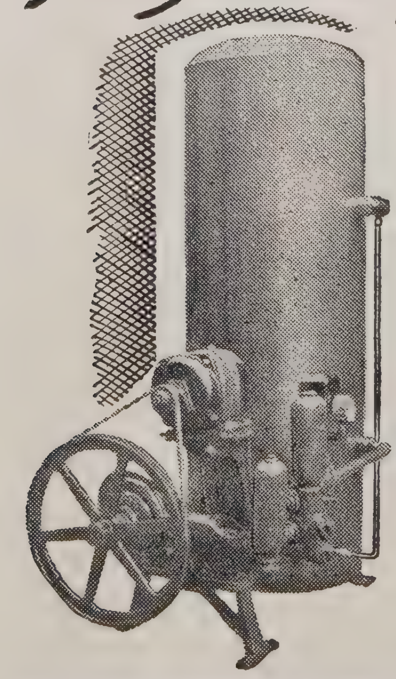

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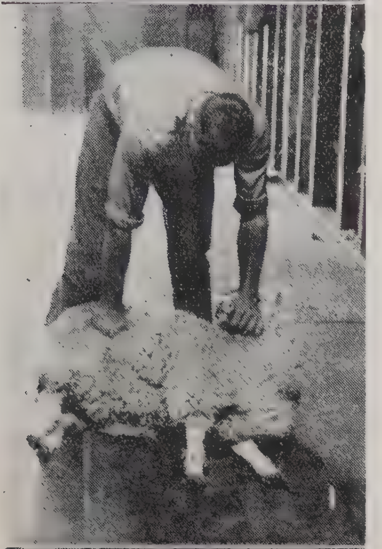
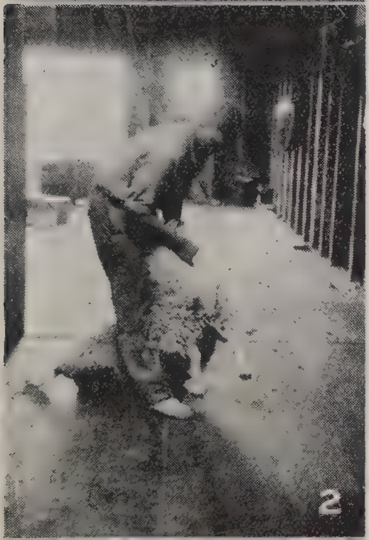
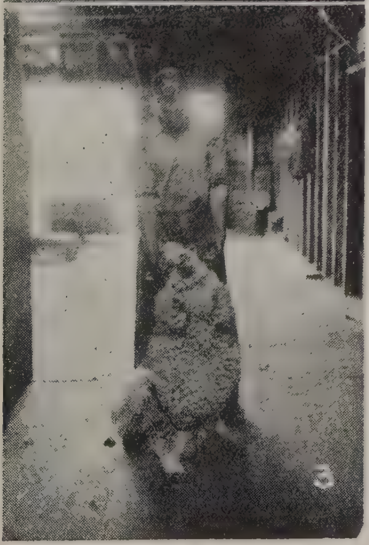
Catching the sheep.







he had reached an age where normally a shearer was well into his stride and would have been shearing for perhaps 10 to 12 years. He was determined, however, to make good. He told me that he was sacked out of his first three sheds, but stuck it, and won a national shearing competition against a very strong team of competitors. His perseverence, an essential asset in shearing, carried him through.

SHEARING A SHEEP.

The accompanying illustrations show the different holds and technique used in shearing a sheep. The first operation is to catch the sheep in the catching pen, and Figs. 1, 2, and 3 show the correct method. An alternative method, particularly if the sheep has its head in a corner of the catching pen or is standing alongside the rails, is to stand immediately behind the animal and, placing one arm around the front of the neck and using the other for purchase off the top rail of the pen, pull the sheep straight back and let it slide down your shins on to its tail. It can then be pulled out in the ordinary way.

The Belly

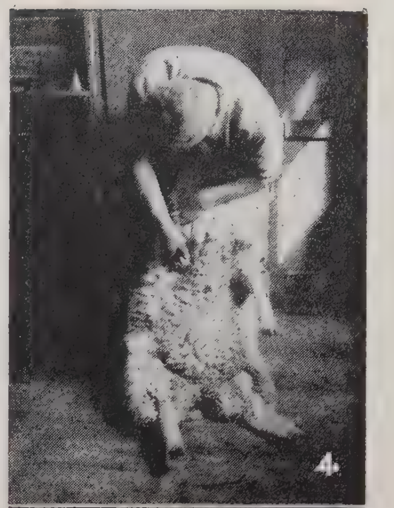
To take the belly off easily it is necessary to have the sheep lying correctly. Only then is it possible to enter the wool from the bare shin under the front leg as shown in Fig. 4. Two or three blows straight down to the flank will then enable the belly wool to be broken, and two or three strokes up will clean the brisket. It is then just a matter of shearing around the belly till the crutch is reached, as in Fig. 5. The belly wool should be torn away from the fleece by the shearer and left on the board to be picked up by either the "fleeco" or "broomee." The position as shown in Fig. 4 is not correct for actual shearing; the sheep has presumably been swung around for ease of photography. The correct position should be sideways to the porthole, not back on. Fig. 7 shows a more correct position.

The Crutch

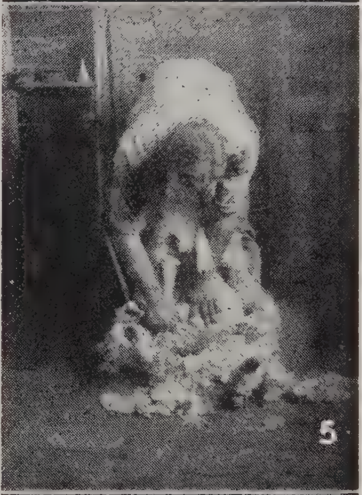
Two or three blows are generally sufficient to clean out the crutch (see Fig. 6), and as this wool is generally short it falls to the board and is swept away as part of the locks.

The First Leg

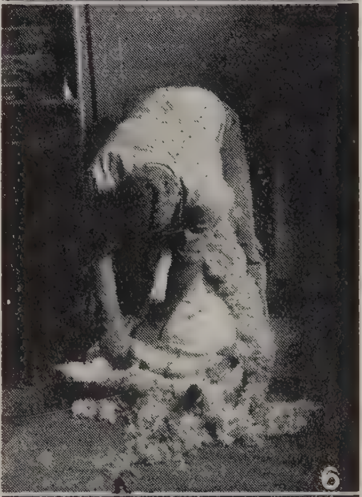
Up to this operation the sheep has remained practically in the one position. For the commencement of the first leg (see Fig. 7) the sheep is shifted slightly, but the greater movement is on the part of the shearer, who moves around with his back more squarely on to the porthole, with



Opening up belly.



Completion of belly.



The crutch.

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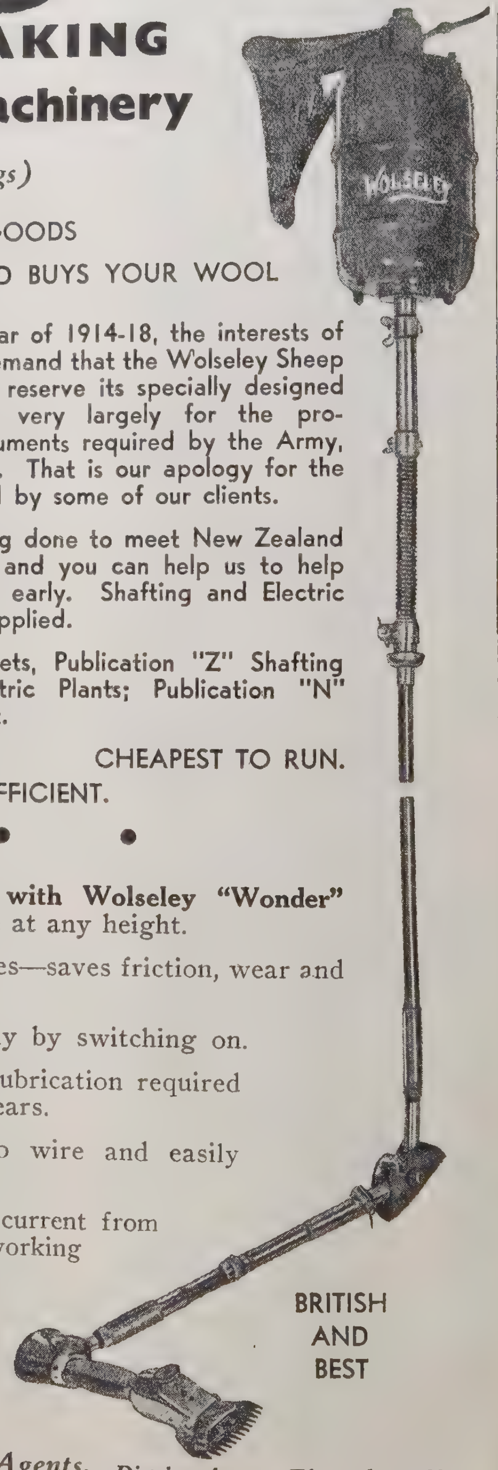

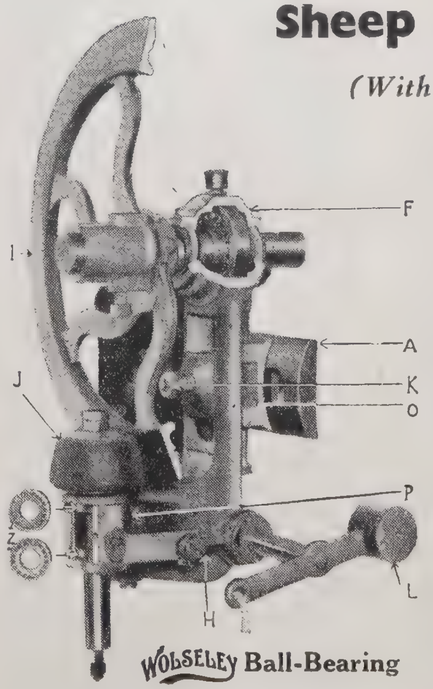

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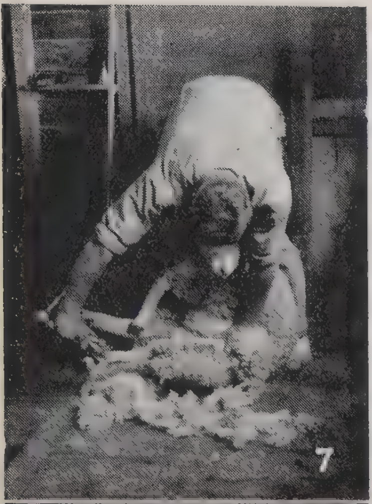
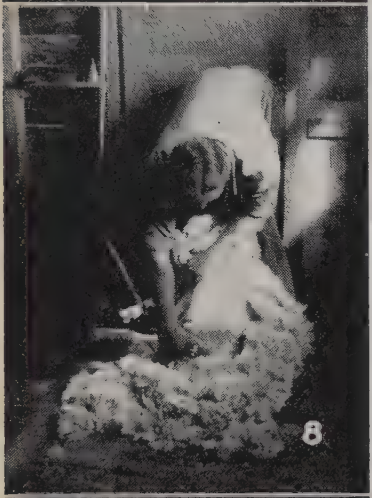
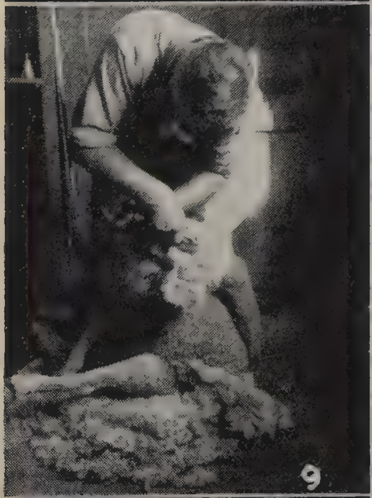


Commencement of first leg.



Finish of first leg.



The top knot.

the sheep lying against his legs. An important point to remember whilst doing the first leg is to keep the hand in the flank as in Fig. 7 and to exert some pressure on the flank to keep the leg stiff and straight. Several blows will be necessary to bring the machine down to the position shown in Fig. 8, where the shearer pulls up the leg with one hand and shears right over the tail and a short distance up the back.

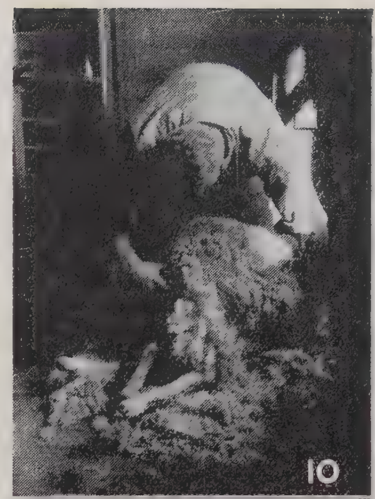
Opening up Neck

On completion of the previous operation and before the position of either shearer or sheep is altered the top knot (Fig. 9) is taken off with one blow. The shearer now alters his position from that of holding the sheep against his legs to that of holding the sheep between his legs as in Fig. 10. The right leg is brought around and placed between the hind legs of the sheep with the knee tucked into the brisket. The other leg is along the sheep's back. In this position, if properly balanced, it is possible to hold the sheep securely by means of the legs only. To open the neck the first blow is started from the brisket and carried right up the neck to come out either under the chin or behind one ear. Another blow or so will be necessary to enable enough wool to be cut to break the neck wool. The practice of looping it over the head is not in favour with wool-classers. Once the neck wool has been broken the wool is shorn from around the ears as in Fig. 11, and from there, with the wool commencing to fall away, the blows are carried from the point of the shoulder partially around the shoulder as in Fig. 12.

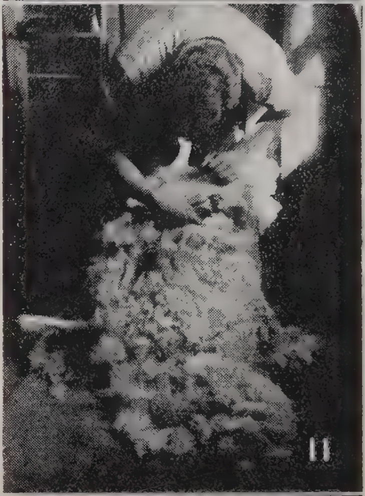
The Long Blow

The long blow follows on after the first shoulder, and in good shearing practice the sheep is being turned slowly as the first shoulder is being done, so that by the time the long blow is ready to be commenced the sheep is lying as shown in Fig. 13. The long blow as its name implies is a blow taken from the tail right through to the back of the ears. As these blows are being done the sheep is being slowly rolled closer to the shearer, so that the middle of the back is more easily accessible. One good blow over the centre of the backbone is sufficient to complete this operation.

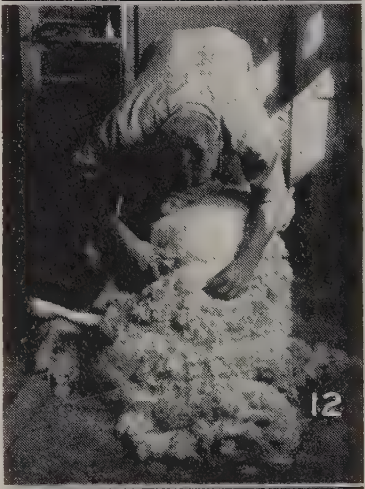
In the position as shown in Fig. 14 the stance of the shearer is that the left leg should be brought out from between the hind legs as shown and placed over the two hind legs, so that all four legs of the animal are between the shearer's legs, which are astride.



Opening up the neck.



Cleaning round head and ears.



The first shoulder.

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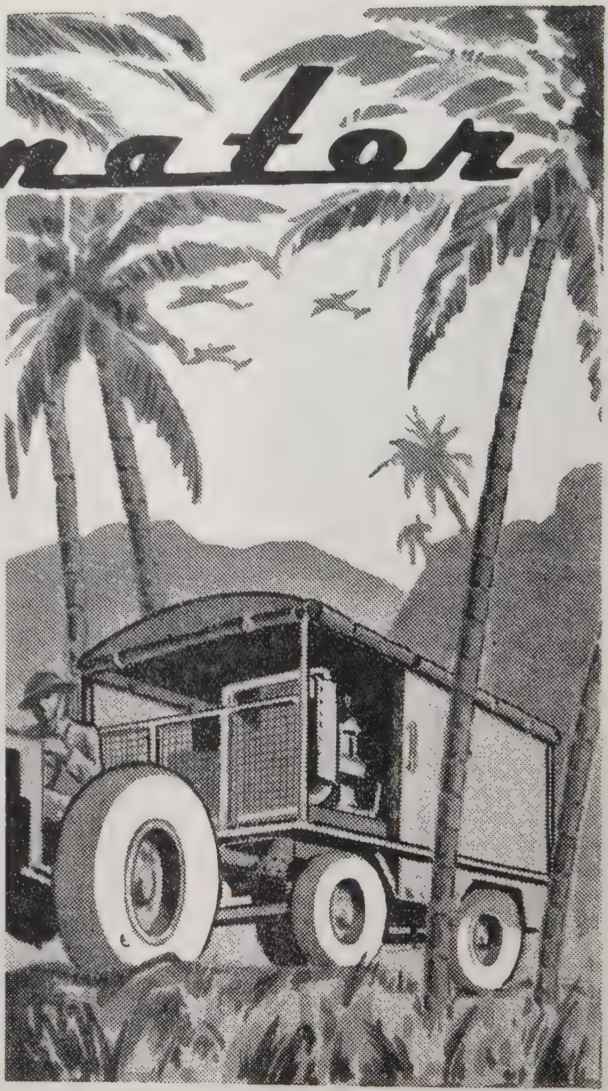

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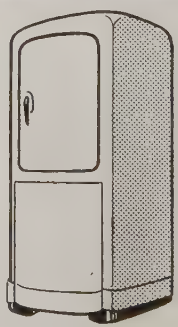

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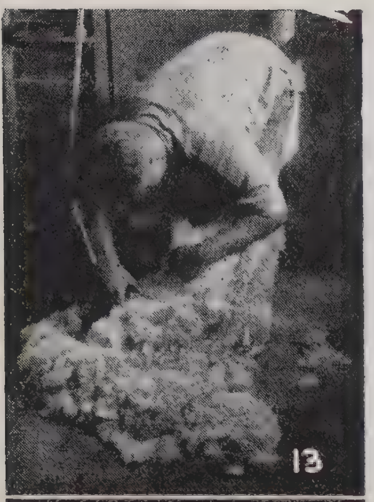
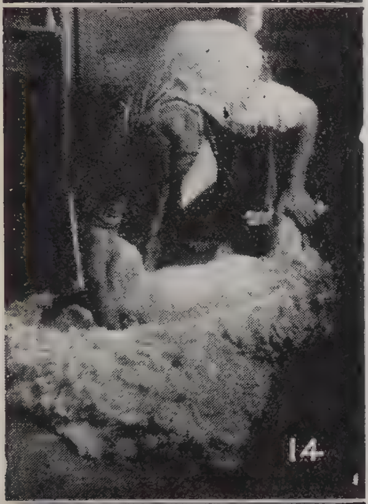


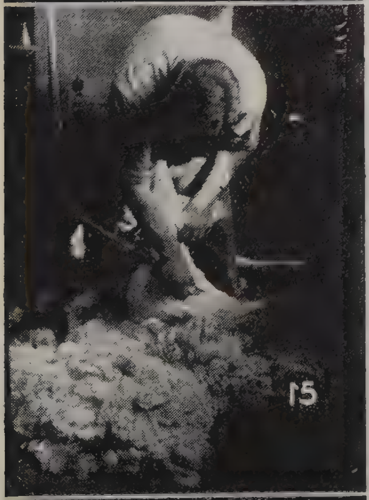
13

Commencement of long blow.



14

The long blow.



15

Coming down to last side.

The Last Side

The first blows on the last side depend on which method was used to open up the neck, as in Figs. 10 and 11. Some shearers clean around both ears on this stroke, others clean around one ear only. If only one ear has been done, it is now necessary to complete around the ears and jaws and then down the neck to the last shoulder, as shown in Fig. 15. At this stage the shearer's left leg is now withdrawn and placed at the back of the sheep, as in Fig. 16. A common hold differing from that shown in Fig. 16 is that instead of holding the sheep's head in the lap with one arm, it is tucked between the legs and held by the legs only. This leaves the other arm free to manipulate the leg if necessary, and it also places the sheep in a more bowed position, which facilitates shearing.

Fig. 17 shows how necessary it is to pull up the slack skin, but if the head is held between the legs, this would not be necessary, as the body is bowed and all the slack is taken up.

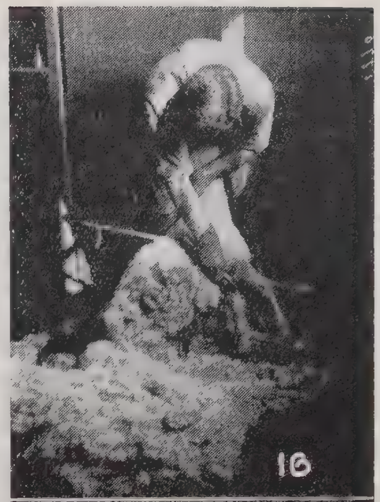
By the time the last leg is reached the head can be withdrawn and the sheep could lie as in Fig. 18. Very fast men do keep the head between the legs till the sheep is finished, but it is not good practice for learners or slow men, as invariably the sheep has only to kick once and the shearer loses control.

The illustrations show that in shearing a sheep it is turned completely around. On commencement it is facing up the board and on completion it is facing in the opposite direction. It must be clearly understood that the accompanying photographs show only the principal holds and blows, and it is recognised that individual shearers have variations of these holds and various short cuts are used which are not shown. The learner in due course will probably adopt several of the better-known ones in his own style.

Fundamental Rules

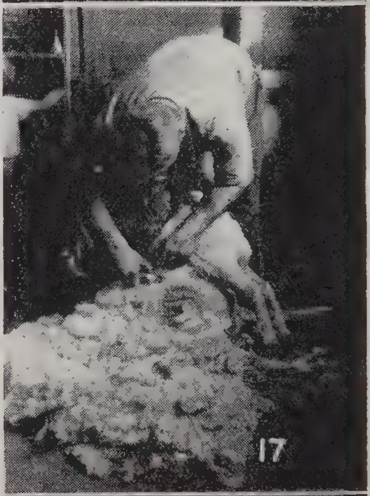
The fundamental rules as laid down by first-class shearers are not many, but if they are not adhered to, one cannot hope to develop into the same category. Experience has shown that the shearer doing 250—300 sheep every day is one whose every stroke and movement is faultless. After seeing one of these men shearing alongside a man who is badly trained or perhaps just learning and doing 100 or so a day it is most obvious that the faster man is not working nearly so hard for his sheep as is the slower man. This is simply because the slower man has not as yet mastered the following cardinal rules of shearing:

(a) Learn to hold your sheep correctly; unless the correct positions are



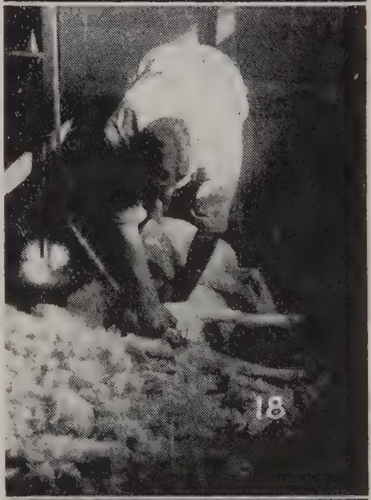
16

Commencement of last side.



17

Last side.



18

Completion of sheep.

mastered, much difficulty is experienced in shearing efficiently.

(b) Fill your comb, not half fill it, with wool; this is one of the most common faults to-day.

(c) Hold your handpiece correctly, namely by keeping the bottom tooth of the comb always on the skin, obviating the ridges so often seen on shorn sheep.

(d) Go forward slowly with a full comb, but come back empty for the next stroke quickly.

(e) Always keep on the skin, because the skin is the shortest way around.

(f) Follow the natural curves of the sheep.

(g) Do not attempt to attain speed until you have mastered all these things and can shear a sheep with a minimum of effort.

Pace a Pitfall

Many a shearer's style has been ruined in attempting to attain speed and big tallies before he has mastered the strokes and fundamental rules. A shearer who tries for pace before mastering all these things develops into a rough, slip-shod shearer, and he finds that he can never become a first-class man, as he cannot break the bad habits formed when learning. It is difficult to refrain from racing, because you may be shearing alongside a man perhaps just as fast or a shade faster than yourself, and it is human nature to beat him if you can. This urge, however, must be stifled, because once you commence racing you sacrifice all else, and if the habit is continued you will ruin your chance to develop into a good shearer.

One of the best shearers I have seen, who would shear better than 300 every day, said that when he was learning his teacher, another great shearer, would not allow him to open up for several seasons, until he had every stroke perfect. He then found that his pace automatically became greater as his strokes grew more precise, and it is a well-established fact that pace will come when all else is learned and mastered. No learner has ever been sacked because he shore a sheep properly. Pace or attempted pace will be the downfall of any learner.

Shearing tallies are discussed, particularly among shearers, with as much fervour and animation as any other record—be it sport or hard work—and rightly so, because to shear the number which have been shorn in New Zealand seems humanly impossible; yet these records are put up and beaten. The record of 406 held by W. Higgens (the last 23 of these sheep he is said to have shorn in 20 minutes) seemed unbeatable, yet another shearer, Sonny White, shore 433 in the same working hours. Other big tallies are often heard of, and in the Waikato last season a shearer shore 417 sheep in 9 hours.

To a good many men these figures would be quite good for a crutching tally, let alone a shearing tally, and many a man would be very tired just pulling this number of sheep out of a catching pen in 9 hours, let alone shearing them as well. A shearer doing 250—300 a day is classed as a good shearer, so the figures quoted above show just what work and perseverance have gone into the shearing technique to obtain these figures.

Don'ts

In conclusion a few don'ts may be of advantage to the new chum in helping him to avoid the pitfalls which arise in shearing:—

Don't half fill your comb; "fill it."

Don't under any circumstances attempt to obtain pace when learning.

Don't dip your handpiece into water during shearing; this dulls the cutting edge of combs and cutters.

Don't leave your comb on longer than one run; excessive grinding will be required to bring it up again.

Try to avoid excess drinking of water, tea, etc., while shearing; too much drinking impairs your work.

Don't hold your shearing arm stiff; a flexible wrist action will enable you to shear easily.

Don't hold your handpiece tightly; a light grasp does not tire your arm and ensures better control over the movement of your handpiece.

Don't make the mistake of screwing down your tension if gear is not cutting. This causes excessive wear. Change, and if still not cutting, stop and look for the fault. A short time spent in adjusting a small fault pays good dividends. Nothing puts a shearer off quicker than a handpiece not cutting sweetly.

Don't overlook the fact that no matter how long you have been shearing it is always possible to learn something.

Finally, **don't** disregard advice tendered to you by an experienced shearer. Most shearers are only too willing to give a new chum help and advice, but disregard that advice once and you will find yourself left to battle on as best you can.

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FACIAL ECZEMA

New Research Station

The Department of Agriculture has acquired 64 acres of land near Manutuke, near Gisborne, for the purpose of establishing a facial eczema research station. The Minister of Agriculture, the Hon. B. Roberts, announced recently that it was hoped to commence the erection of buildings, yards, and fences at an early date.

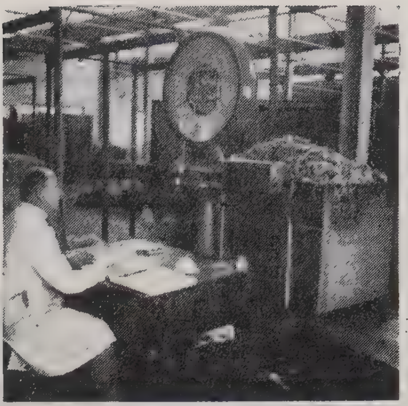
"The property will be subdivided into small paddocks and will be well equipped with yards and sheds for handling the experimental sheep," said Mr. Roberts. "A small laboratory will be provided, and staff accommodation and sheds for housing the grass dryer and agricultural implements will be erected."

PASSION FRUIT

Bulletin No. 135, "Passion Fruit Culture," is now available **free** from the Department of Agriculture, Wellington.

WOOL APPRAISEMENT
How It Works

In its initial stages the detailed working of the Wool Appraisement Scheme was something of a mystery to the average wool-grower. Latterly the brokers have all been issued with full details of the system, and in many cases have explained these to their clients. Many misconceptions still exist among farmers, however, and this article is written in an attempt to clear them up.



By

J. E. DUNCAN,
Wool Supervisor, Livestock Division, Wellington.

A Precedent— *"The Commandeer"*

The present wool appraisement system is not novel in its general principles, as it is very similar to the system used in the last war and brought into force on December 21, 1916. The requisition of New Zealand wool for the use of the Imperial Government on that occasion was generally referred to as "The Commandeer," and covered the purchase of four clips from 1916-17 to 1919-20. The prices of the various grades of wool were fixed at 55 per cent. above the ruling rates for the 1913-14 season, and the clip was bought for the duration of the war and one season thereafter. There was also the provision that Great Britain would bear any losses involved in the resale of New Zealand wool, but would give the New Zealand producers a half-share of any profits made in such transactions. The clip was classified into something over 200 types of greasy wool for purposes of appraisal, and the average price paid to growers was 14.96d. per lb.

"BAWRA"

At the close of the commandeer period Britain still held enormous stocks of unsold wool, including almost 800,000 bales from New Zealand. It was in an effort to dispose of this surplus without completely glutting the market that BAWRA was formed. The name stood for British Australia Wool Realisation Association, Ltd., and it was established in January, 1921. In addition to the operation of BAWRA in disposing of old stocks of wool, regulations were brought in in New Zealand, firstly completely prohibiting any sales of the new clip for two months, and later allowing increasing quantities to be sold, but with the imposition of a minimum price. As market values were steadily rising, the minimum price clause was revoked in 1922, but a permanent legacy from this period is the control of quantities of wool offered at auction sales by the Wool Committee, which has persisted. This committee still functions, and includes a chairman appointed by the Minister of Agriculture and representatives from the Wool Brokers' Association and the Sheepowners' Federation. With the disposal of all surplus wool stocks by 1924, BAWRA was dissolved, after performing in an outstanding manner a necessary and difficult task.

Normal Disposal Methods

Before describing the present appraisal system it is desirable to consider something of the usual methods of wool disposal which immediately preceded it.

At the beginning of the century only a quarter of the wool grown in New Zealand was sold through the auction sales conducted by the wool brokers, the remainder being sold by direct consignment to Britain, or by private treaty to country wool-buyers. By 1913 approximately half the clip was being sold at auction, and by 1934 the proportion had risen to 81 per cent. Just prior to the present war this figure had risen still further, to approximately 85 per cent., so it would be safe to say that sale at public auction is the normal method of disposal for most of the wool grown in New Zealand. Prior to the war the methods of disposal actually open to the grower were as follows:—

1. Sell wool at auction through a broker.

(a) The broker both skirting and classing the wool.

(b) The farmer doing the skirting, but leaving the classing to the broker.

(c) The farmer skirting and classing, the broker merely displaying and selling.

(d) Small lots were often skirted and sent to the broker for binning, or

(e) Sent to the broker for skirting and binning. (Binning is the process of gathering together large numbers of fleeces of similar type from various sources to make a large, even, saleable line.)

(f) Lines of 3 bales or less might be "interlotted" by the broker with other small lines of similar type, to avoid "star lots." (A "star" is any lot of less than 4 bales, and is not sold in the main catalogue.) This interlotting was done free of charge, while binning was charged for, but in many cases the latter method still brought the grower the better net return.

2. Ship direct to England for sale at the London wool auction sales.

3. Scour wool locally and ship to London for sale. There is normally no demand for the scoured product in New Zealand.

4. Sell by private treaty to an itinerant wool buyer.

5. Sell to a co-operative concern specialising in wool-sorting.

6. Or a combination of any of the above.

Grading and Inspection

These are not normally Government functions at all. In peacetime there is no compulsion on the farmer to carry out any grading of his wool, although it is in his own interests to do so. He may either class his wool himself, or employ a professional woolclasser to do it for him, or he may leave these functions to his broker.

Inspection of wool offered for sale at auction comes within the province of both the Wool Brokers' and the Wool Buyers' Associations. Both these bodies have books of rules and regulations, which cover the manner in which wool is to be handled, displayed, and sold. In normal times the Buyers' Association employs an inspector, who visits the wool-stores prior to sale, and sees that the brokers observe the conditions mutually agreed upon between the two associations.

Although the Government enforces no laws covering the grading of wool, the Department of Agriculture takes an active interest in advising and instructing farmers in the best methods of preparing their wool. In normal times two officers are employed, whose work is mainly the giving of advice, lectures, and demonstrations to farmers on wool-growing and the proper preparation of their wool for sale. This instructional work covers the whole of New Zealand, and is carried out in conjunction with a certain amount of investigational and extension work on related problems, all with the same ultimate objective; viz., to encourage the most efficient methods of wool production combined with the most effective means of marketing.

THE APPRAISAL SYSTEM.

Immediately on the outbreak of hostilities in 1939 Britain once more offered to buy all our wool for the duration of the war and one season thereafter. The only point in question was the price to be paid, and a meeting was held in Wellington to determine this. All interested parties were represented—the producers of the wool, the Government, which would have to administer the scheme, the Wool Brokers' Association, which would have to handle the wool, and the Wool Buyers' Association, which would have to supply the personnel to carry out appraisement. The aim was to fix a price which, while being reasonably remunerative to the farmer, would not unduly penalise Britain. An average price of 1/- per greasy lb. for the grower of the wool was agreed upon as a fair one, and when the negotiations were completed the net average price to the farmer worked out at 12.25d. per lb.

The next step was to secure a body of men to implement the appraisal system, and the only ones available in the country with the requisite knowledge and experience were the woolbuyers. The Wool Buyers' Association immediately set to work to draw up a type and price schedule for all grades of wool, or, as it is generally referred to in the trade, the "Bareme." Some idea of the magnitude of this task can be judged from the fact that eventually 977 types of greasy wool were established, for each of which a standard clean-scoured price had to be fixed; so that the **over-all average price** to the farmer for the 800,000 odd bales of greasy wool falling into these many different grades would work out at 12.25d. per lb. in the greasy state—the figure agreed upon with Britain. Besides the Bareme for greasy wool there is another for the slipe wool from freezing works and fellmongers, embracing nearly 500 additional types.

A Controlling Appraiser was appointed, who has one Assistant Controlling Appraiser stationed in the North Island and one in the South. Each of these assistants has attached

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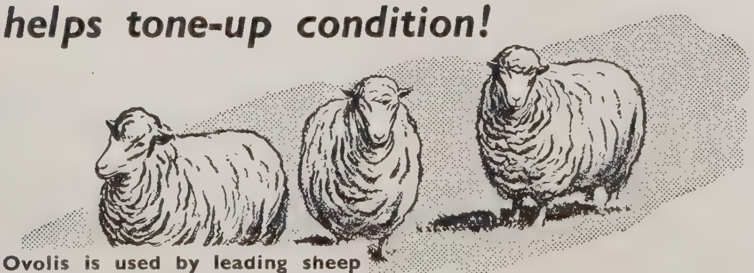
helps tone-up condition!



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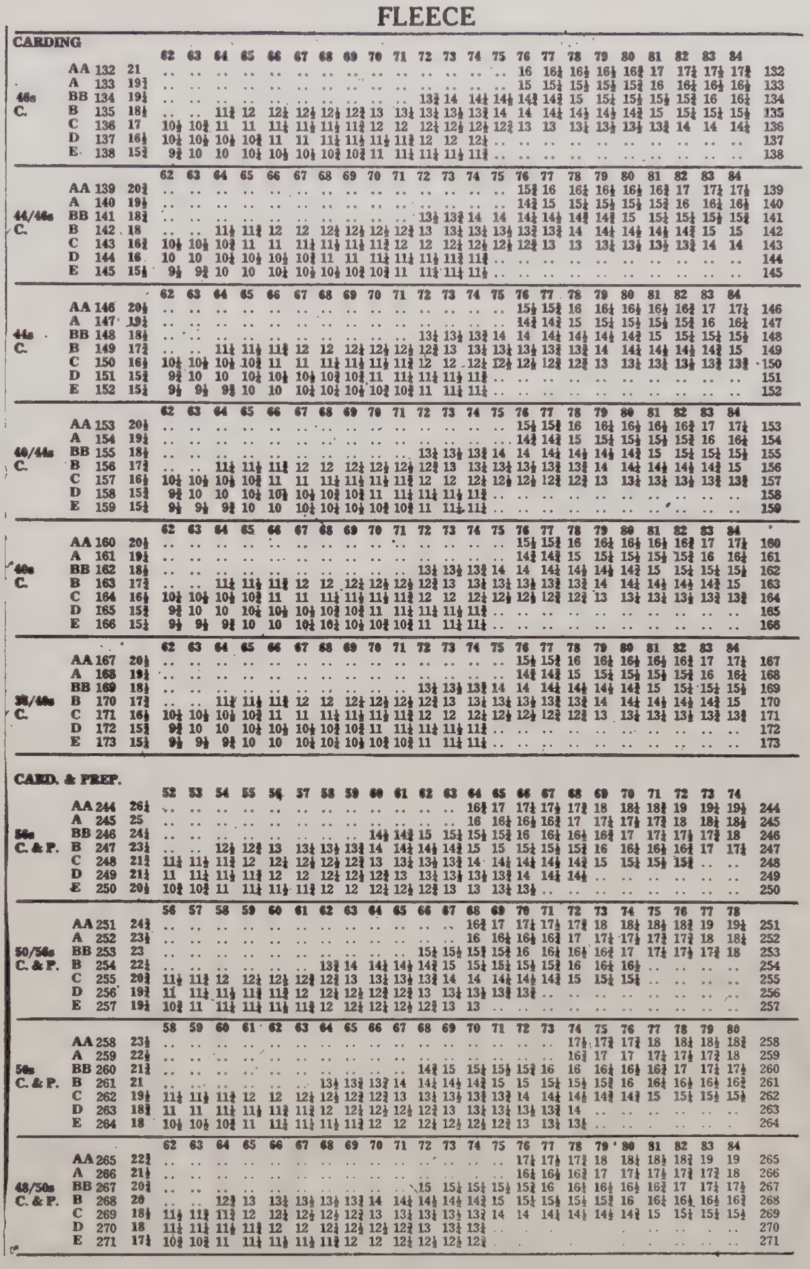
FLEECE
CARDING
CARD. & PREP.

Fig. 1.

to him a team consisting of supervising appraisers, appraisers, and samplers. The actual numbers vary according to the amount of wool which has to be dealt with, and members are transferred between the two teams as required to handle the work. A large clerical staff is also necessary. Instead of a roster of auction sales being drawn up, as was done before the war, a list of wool appraisals is now prepared, covering the normal selling season. Before the war wool was sold at eight centres, namely, Auckland, Napier, Wanganui, Wellington, Christchurch, Timaru, Dunedin, and Invercargill. Since then it has been found necessary to include additional appraisal points to expedite the handling and shipping of the wool, and these are Tokomaru Bay, Tolaga Bay, Gisborne, Nelson, Blenheim, and Oamaru. Facilities for storage and valuing were provided at these points. As far as the wool brokers are concerned the introduction of the appraisal system has not brought about any radical changes. The wool is handled and displayed in the same way as previously, but there is now no point in a farmer pestering the broker to get his wool into a particular sale, as sometimes happened previously, because whatever appraisal it is sold at the basis of valuation will be exactly the same.

The appraisers work in pairs, and later their work is checked by a supervising appraiser, so that uniformity in valuation will be preserved from store to store and centre to centre. Provision is also made that if the broker (acting on his client's behalf) considers that any lot of wool has been under-valued, he can have it rechecked, and if necessary the supervising appraiser can be called in to act as arbiter. His decision is final.

Details of Scheme

In Fig. 1 is shown a reproduction of a single page of the Bareme, and it will be noticed that it is headed "Fleece," provision being made on the remaining 15 pages for all other types of wool such as cotts, pieces, bellies, locks, etc. In the top left-hand corner the word "Carding" appears, indicating that the wool is of this type—i.e., relatively short in staple. The count or quality number indicates the average fineness of the fibre—the higher the count the finer the fibre. In New Zealand the range of counts from 36's to 70's covers practically all the wool we produce, and the Bareme is designed to cover this range. Some lines of wool may be straight, even types, e.g., 46's Carding. Others may be inclined to be mixed in fineness, so that a range of counts such as 40/44's or 44/46's is necessary to cover all the wool in that line. As will be seen these have been provided for, and the price adjusted accordingly, to cover the mixture of types.

It will be noticed that on the lower portion of the page wools of mixed lengths have been provided for under the heading "Carding and Preparing"—the preparing wools being longer stapled. (This is only the beginning of the range, which finishes on the next page, with 36/40's.) Preparing wools are set out by themselves. The reason for dividing the wool up according to length is so that it can be allocated to mills which have the appropriate type of machinery for handling it.

Each main category of wool is subdivided into seven types, e.g., 46's. Carding can be type AA: A: BB: B: C: D: or E, but for the sake of brevity each of these types within the category is given a distinguishing type number—in this case from 132-138. In practice these numbers are all that are required to nominate any of the 977 types of greasy wool. The letters AA-E refer to the grades of wool within the category from Super to Inferior—for although two fleeces can both be 46's Carding they may be very different in other characteristics, such as yield, colour, tensile strength, freedom from seed, etc., all of which have a big influence on commercial value. The actual definitions for the various types as set out in the Bareme are as shown in Fig. 2.

FLEECE.

Super	**AA**	Good colour, well grown, sound, well skirted, well classed, free from fault.
Good/Super	**A**	Good colour, well grown, sound, well skirted. Free, may contain very slight fault, suitable spinner.
Good	**BB**	Good colour, well grown, well skirted, free or practically free from seed, may contain slight tender.
Good/Ave.	**B**	Good topmaking, fair to good colour, skirted, may contain odd cott and/or very slight seed.
Average	**C**	Topmaking, fair colour, may contain few cotts, may be unskirted and/or bush stained and/or part seedy.
Ave./Inf.	**D**	Average to inferior topmaking, may be poor colour, may be cotty and/or seedy, unskirted and/or bush stained.
Inferior	**E**	Any wool inferior to the above mentioned grades.

GENERAL.—Hairy or badly bred wools must be thrown down in grade.

Fig. 2.

Some of them require amplifying to make the full meaning clear to the layman.

Super—AA

To get into this category a wool must be almost perfect, and although a number of fleeces in a bale may reach the required standard, it is seldom that the whole bale will qualify, unless the classing has been very well done. To take an example from last season's appraisals—in the category 56's Carding the following were the numbers of bales in each grade for the whole Dominion:—

	Grade.	56's C. Type No.	No. of Bales, 1943-44.
Super ..	.. AA	83	7
Good/Super	.. A	84	218
Good ..	.. BB	85	3,188
Good/Average	.. B	86	10,755
Average ..	.. C	87	3,629
Average/Inferior	. D	88	78
Inferior ..	.. E	89	1

It will be observed how few bales were included under the two extreme grades AA and E, and how many fell into the three middle grades. In many categories no wool at all will be found under AA or even under A, and very little under D and E.

Good/Super—A

To qualify for this grade a wool must still be very high-class in most respects. Colour is important, because the wool may well be used for an undyed material, and even with dyeing, where light and delicate shades are required, stains and discolourations in the raw material are detrimental.

"Well grown" means that the staples or locks of wool should separate freely and be uniform in characteristics from butt to tip. With the exception of the Down breeds, the crimp should be well defined and regular—a sign that growth has been steady and unchecked. The yolk should not be excessive or deeply coloured, but should be well distributed along the length of the fibres to protect them from weathering.

"Sound" means that the staple and the individual fibres comprising it must be free from weak places, and be capable of withstanding a fair degree of tension. "Breaks" are weak zones in the staple where the individual wool fibres are reduced in thickness by a check of some kind which the sheep has received. Any severe setback, be it due to starvation, ill health, or climatic conditions, will be reflected in the wool as a weak zone, corresponding in extent and position on the staple to the duration and timing of the check.

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Good skirting is necessary to separate out all inferior wool, and will be dealt with in detail later. If skirtings are left on, the appraiser has to play safe by lowering the grade and the value of the wool, because he cannot be sure how much of this inferior material there may be in a bale.

"Free" means that the wool must be free from seed and vegetable matter in general. Wool containing seed has to be specially treated at the mill, involving extra labour and expense.

To be suitable for the spinning section of the trade a wool must be of good quality in most respects, particularly in regard to tensile strength and uniformity.

Good—BB

Most of the good qualities already specified are still required in this grade, but a certain amount of slightly tender wool is permissible; this means wool which is not absolutely sound and shows some diminution in tensile strength, either as localised "breaks" or general "tenderness" throughout the length of the staple.

Good/Average B

More of our wool falls into this grade than into any of the others. The name Good/average gives a good indication of the sort of wool included. Wool for the top-making section of the industry must be of reasonably good all-round quality, but need not be up to the same high standards required for a "spinner's" wool. It should be noted that the wool must still be skirted—for even if it is up to standard in all other respects, it still cannot qualify for this grade if skirtings are left on. "Cotts" (matted fleeces) are of inferior value, because they have to be put through a special opening process, which causes a good deal of fibre breakage. When this wool is subsequently combed these short broken fibres are separated as "noils," which are of much inferior value, so the proportion of cotts allowed in this grade is not high. Very slight seed means what it says, with the emphasis on the "slight."

Average—C

The main difference between this grade and the one above is that the wool need not be skirted. In many cases—as will be shown presently—it is merely a waste of effort and money to attempt to do much in the way of skirting to wool of this type.

"Bush-stained" means that the wool may be stained with charcoal from the blackened logs on bush-burn country, and a higher proportion of seed or vegetable matter is often responsible for wool being reduced to this grade.

Average/Inferior—D

By the time this grade has been reached the wool may show a high proportion of the faults enumerated, although it still has plenty of commercial uses in certain sections of the trade, for articles where cheapness is the prime consideration.

Inferior—E

This grade includes all the very poorest fleece wool, and in addition to the faults already enumerated may contain much sand or earthy material, harsh handling and hairy fibres, and kemps.

General

This footnote must be emphasised. Hairy wools are considered inferior by the manufacturers, because the hairy fibres show up a lighter shade when the material is dyed. The reason for this is that a hairy or medullated fibre is hollow (in contradistinction to a pure wool fibre, which is solid), and the air trapped in this hollow core of medulla makes the fibre appear much lighter in shade after dyeing. Badly-bred wools include those which show long straggling tips to the staples, harsh handling wools, fuzzy or characterless wools, fleeces with odd scattered black fibres, and wool which shows marked irregularity in characteristics from one portion of the fleece to another.

HOW WOOL IS VALUED.

In Fig. 3 is shown in detail part of a page from the Bareme, the section dealing with a particular category of wool—46's Carding. On the left are three columns—the first two, indicating the grade and the type number, have already been explained. The third column ranging from 21d. to 15¾d. is the "clean price," i.e., the price in pence per lb. that will be paid for that particular grade of wool in the clean-scoured condition. In practice, of course, the wool is bought in the greasy state and one of the principal tasks of the appraiser is to estimate the "yield" of the wool—i.e., what proportion of clean fibre will be left after all grease and dirt have been scoured out. This yield is always expressed as a percentage, e.g., a yield of 73 per cent. means that out of 100lb. of greasy wool 73lb. of clean fibre will remain after all foreign matter has been removed. Correct estimation of yield is difficult, and requires long experience. The appraisers have had pre-war buying experience where their living depended to a considerable extent on their ability to assess yield correctly, so it is not often that they make serious mistakes. With the team work and checking which takes place errors are still further reduced.

When the clean value and the yield of a wool are known a simple sum in proportion is required to arrive at the greasy value.

$$\frac{\text{Clean Value} \times \text{Yield}}{100} = \text{Greasy Value.}$$

e.g., Suppose the clean value of a certain wool is 16d. and the yield is 75 per cent., then $\frac{16\text{d.} \times 75}{100} = 12\text{d.}$, the greasy value.

To save tedious calculations of this nature, a range of yields is set out—in this case from 62 per cent. to 84 per cent., and below each of these can be read off directly the greasy price—e.g., see Fig. 3. 46's Carding B, Type No. 135. Clean price, 18½d. Yield, say, 77 per cent.—then greasy price is 14¼d.

In brief, the procedure followed in valuing is as follows:—

CARDING				62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	
	AA	132	21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16	16¼	16½	16½	16¾	17	17¼	17½	17¾	132
	A	133	19¾	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15	15¼	15½	15½	15¾	16	16¼	16½	16½	133
46s	BB	134	19¼	..	..	..	..	..	..	..	..	..	..	13¾	14	14¼	14½	14¾	14¾	15	15¼	15½	15½	15¾	16	16¼	134
C.	B	135	18½	..	..	11¾	12	12¼	12½	12½	12¾	13	13¼	13¼	13½	13¾	14	14	14¼	14½	14½	14¾	15	15¼	15¼	15½	135
	C	136	17	10½	10¾	11	11	11¼	11½	11½	11¾	12	12	12¼	12½	12½	12¾	13	13	13¼	13½	13½	13¾	14	14	14¼	136
	D	137	16¼	10¼	10½	10½	10¾	11	11	11¼	11½	11½	11¾	12	12	12¼	..	..	..	..	..	..	..	..	..	..	137
	E	138	15¾	9¾	10	10	10¼	10½	10½	10¾	10¾	11	11¼	11¼	11½	11¾	..	..	..	..	..	..	..	..	..	..	138

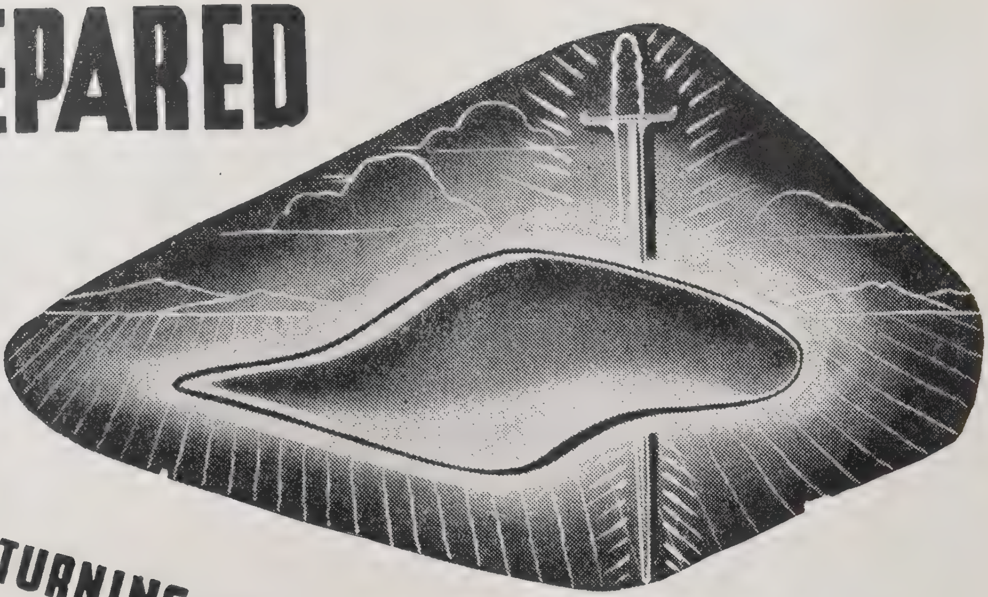
Fig. 3.

(a) The kind of wool whether fleece, hogget, lambs, pieces, etc., is at once apparent to the appraiser, apart from the fact that it is specified in the broker's catalogue. (e.g. Fleece.)

(b) The appraiser next examines the wool and determines the average count, or range of counts. He may require to pull more-or-less wool from the open ends of the display bales for this purpose. (e.g. 46's.)

(c) At the same time he decides on the length—whether it is preparing,

BE PREPARED



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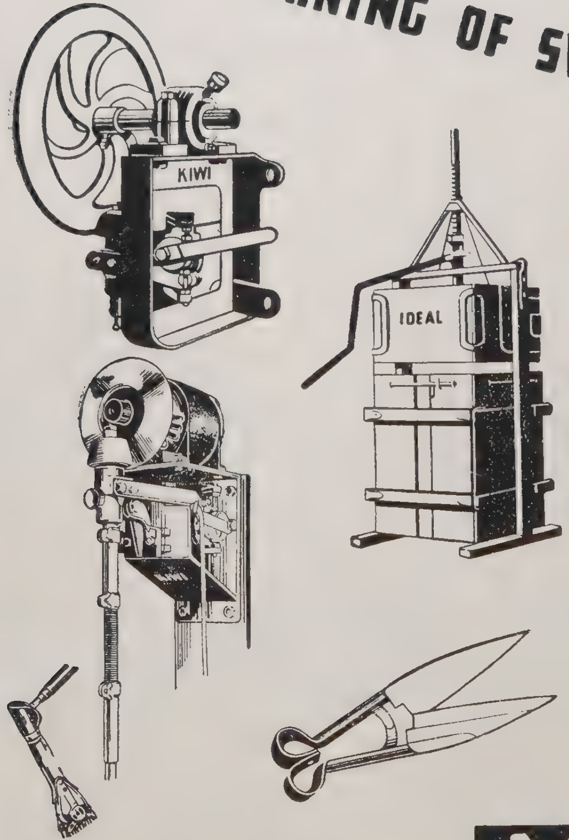

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carding, or a mixture of these. (e.g. Carding.)

(d) He now determines the grade, by considering the various factors set out above, including a test for soundness by stretching a staple reasonably tightly between the thumb and forefinger of each hand and drawing the middle finger of the right hand sharply across it. If the wool is reasonably sound it will stand this test and emit a sort of "twang." (e.g. The grade is decided as BB. This also sets the type number. 46's Carding. BB. equals Type No. 134.)

(e) The next thing is to estimate the average yield. (e.g. 79 per cent.)

(f) The greasy price can now be read off directly from the Bareme at the inter-section of the line opposite Type No. 134, and the column under 79 per cent. The greasy price is thus seen to be 15¼d. per lb., and is entered up in the appropriate column in the catalogue.

Price Alterations

Under the original agreement with Britain she offered to pay an over-all average of 10.55d. sterling per lb. for our wool, which included the charges for appraisal and handling up to f.o.b. The appraisers are paid set salaries, and the brokers receive 5-8d. per lb., to cover the handling, insurance, etc., of the wool.

They are also paid storage at the rate of 3d. per bale per week, after the initial free storage period of 28 days has expired. The average price received by the farmer for his wool, from Britain, in the original agreement was 12.25d. per lb. Of course, from this had to be deducted the charges for services rendered by the broker.

e.g.—

5-8d. per lb. for skirting and binning.

3-8d. per lb. for binning alone.

½d. per lb. for skirting and classing.

¼d. per lb. for classing alone.

1/6 per bale for inter-lotting.

Displaying and selling the wool is included in the 5-8d. which the broker is paid by the Government, and is not a direct charge on the farmer.

It will readily be appreciated that with a quantity of wool as large as the New Zealand clip, and comprising so many types, it was virtually impossible for the average to work out **exactly** at 12.25d., so a Retention Fund of 5 per cent. was established to cover discrepancies. That is to say, the farmer was actually paid out the value of his wool less 5 per cent. 14 days after the completion of appraisal. Thus, if the season was a poor one and the style of the clip below average, it meant that appraised values would be somewhat down. So at the end of the season the farmer received his share of the 5 per cent. retention money, plus the difference by which actual average appraised values were below 12.25d. Conversely, in a particularly good season the reverse would apply, and the pay-out at the end of the year would be slightly less than 5 per cent., although this has not so far occurred.

The Retention Fund also takes care of any slight alteration in the standard of valuing from season to season, for in spite of every care the appraisers are only human, and there is a long gap between wool seasons.

On account of increased costs of production in Australia, Britain granted that country an increase of 15 per cent. for her wool in 1942. At the same time she voluntarily granted a similar increase to South Africa and New Zealand, bringing the price to the New Zealand farmer up to 14.0875d. per lb.

Actually the farmer did not receive the whole of this 15 per cent. increase, as it was decided in the interests of stabilisation not to increase the issue price of wool to our local New Zealand mills, which still get it at the old price of 12.25d. per lb. The aim was to prevent a further increase in the price of clothes. As the local mills, even in wartime, use only some 5 per cent. of our wool, the effect on the price received by the farmer was relatively small, and he actually received 13.9676d. for his wool last season, instead of 14.0875d., which would have represented the full 15 per cent. During 1942 the Retention Fund was increased to 10 per cent., and the present arrangement is that at the end of the season the wool-grower receives half of this in cash and the other half in bonds, or he may elect to take the full amount in bonds. (In practice the farmer can sell these bonds for cash if he so wishes.) The adjustment money, i.e., the small addition to the retention money, is also paid in cash. The half-share of any profits made by Britain on resale of our wool will be paid out in a lump sum after the war.

PREPARATION OF CLIP FOR APPRAISAL.

In New Zealand the **average size** of flock is approximately 1,000 sheep, and the number of bales of wool these will produce varies from, say, 20 to 30, according to circumstances. It must be remembered, however, that this average of 1,000 sheep is derived from a relatively large number of small flocks, and a correspondingly small number of large flocks, and actually nearly three-quarters of the country's flocks are of less than 1,000 sheep, and half of them less than 500. On this basis at least half our wool clips are of 15 bales or less, so the amount of wool-classing that can be done on the farm is strictly limited in these cases. However, before dealing with classing it will be necessary to consider the preliminary stages of skirting and rolling.

Skirting

The object of skirting is to remove all the wool below the average quality of the fleece, thus enhancing the value of the fleece wool and leaving it as uniform in length and quality as possible. Proper skirting calls for careful judgment, as each fleece has to be treated on its merits, but it is nevertheless broadly governed by certain factors, for example: **1,** Whether the fleece is crossbred or Merino; **2,** whether it is good or inferior; **3,** whether it is free, slightly affected with seed, or seedy throughout; and **4,** to some extent by the state of the market. This factor does not apply at present, of course.

1. The main difference is that with Merino the skirting has to be deeper and heavier than is generally the case with crosbred wool, because Merinos are densely covered with wool right to the points, and there are more dirty edges to be removed from the fleece. This applies to halfbred and Corriedale wools to a lesser degree.

Dealing now with wool of the crossbred type, Fig. 4 shows skirting being done by two men working in unison. They usually start at opposite ends of

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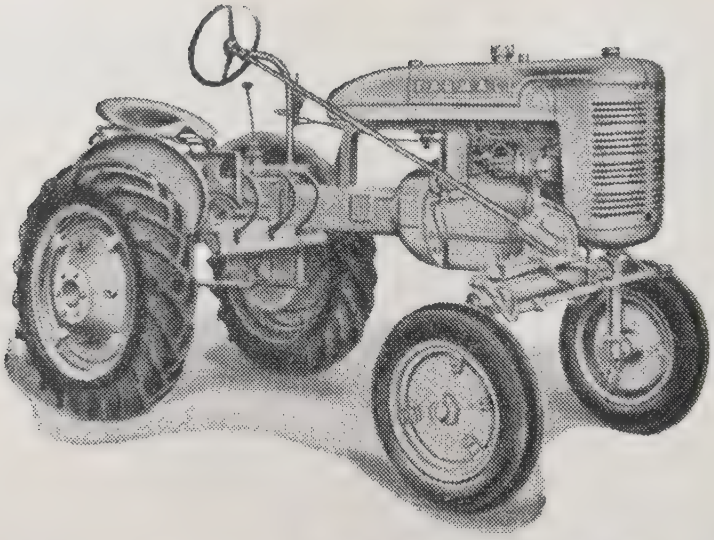

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Fig. 4.—Skirting: Team work does the job quickly.

the fleece and the job is quickly completed, by pulling off the inferior wool, but where a single skirter is employed the principle is still the same. The diagram Fig. 5 shows what is removed, but it must be emphasised that there are no hard-and-fast rules about this, and the sketch merely illustrates the average range found with crossbred wool.

2. If a fleece is good except for a small area round the edges, it will be well worth while removing all the inferior wool. This will bring in the best overall returns. E.g., suppose the **bulk of a fleece** is of B grade, or better, then skirting should be worth while, because if the skirtings are left on it cannot be graded higher than C at best.

To take a specific example, suppose 100lb. (about 10 fleeces) of 46's Carding wool with skirtings on is graded as C grade and 70 per cent. yield, it will be worth 12d. per lb.—a total of 1,200d. After 20lb. of skirtings have been removed there is 80lb. of 46's Carding B grade wool left, yielding 73 per cent. and worth 13½d. per lb., which comes to 1,080d.; but the various skirtings themselves are worth 196d., so the total value is now 1,276d.—a gross gain of 76d. on 100lb. of wool, and a net gain, after allowing for labour, of at least ½d. per lb.

If the bulk of the wool was of **BB grade** the removal of the skirtings would be still more profitable, as the remaining wool would be worth at least 14d. per lb., and the net gain would be in the vicinity of 1d. per lb., after allowing for labour.

If the fleece is inferior and dingy throughout, it is obvious that no amount of skirting will convert it into a good fleece. E.g., if the **bulk** of a fleece is of C grade or lower, skirting cannot possibly lift it to B grade; in fact, heavy skirting will be simply throwing money away, because it will mean so much less wool to be paid for as C grade, and a correspondingly larger amount of low grade and low value skirtings. In a case like this all that should be done is to remove the worst of the short, stained, and heavy conditioned wool from round the edges of the fleece, thus slightly increasing the yield, and hence the value of the remaining wool, which will still be in C grade, nevertheless.

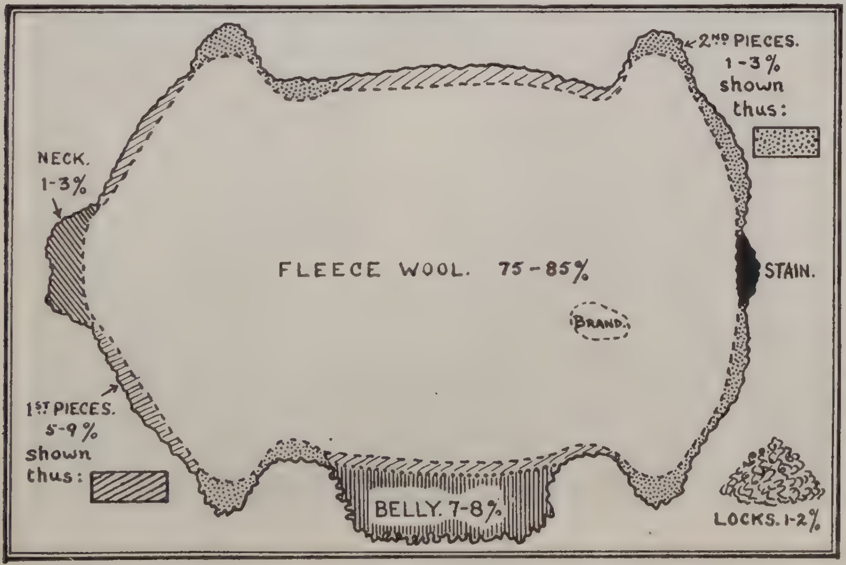
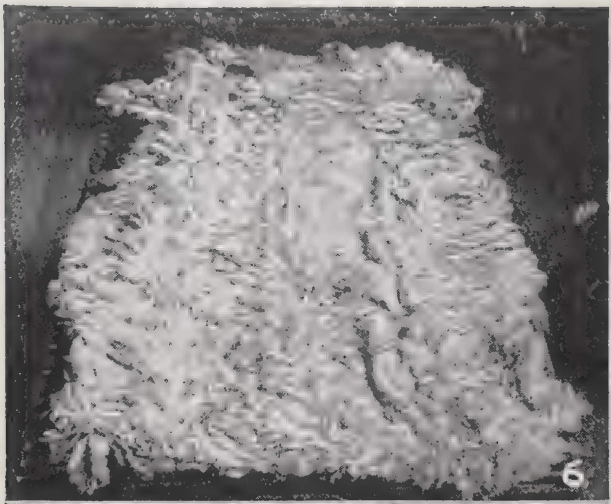


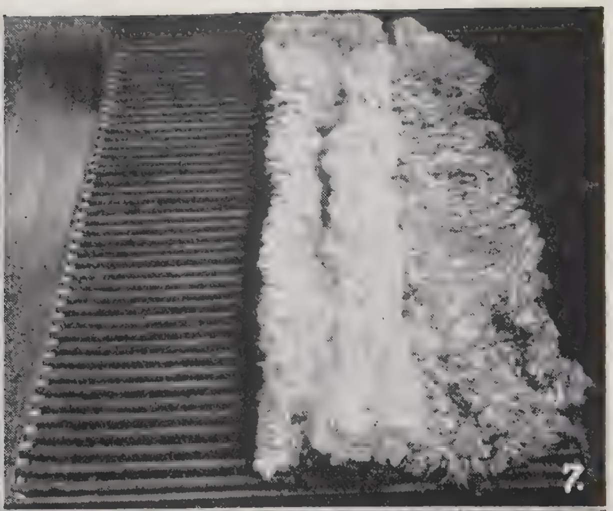
Fig. 5.—Skirting diagram illustrating the range of oddments to be removed from an average XB fleece.

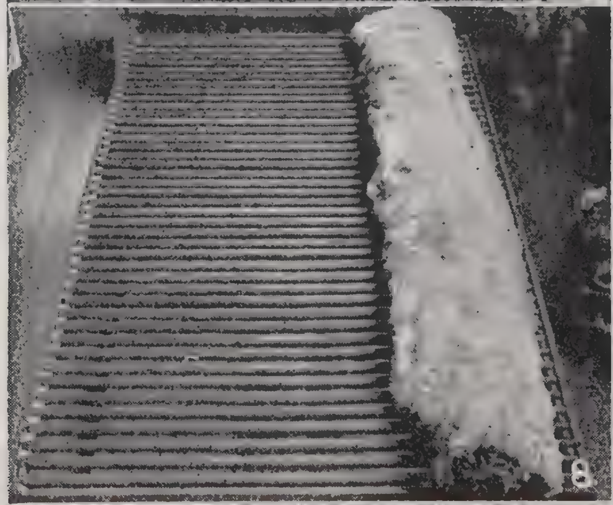
3. A similar principle applies to the treatment of seedy wool. Any small amount of seed around the points and edges should be completely removed, as it will greatly detract from the value of the fleece wool if any is left on it. If a fleece contains any appreciable quantity of seed, it cannot go above C grade, even though this seed is confined to the edges. The bulk of the fleece might well be of B or BB grade, and leaving on these seedy skirtings would occasion a loss of from 1d. to 2d. per lb. with medium crossbred wool, according to conditions. What is still worse is that one or two such fleeces can easily pull down the value of a whole line of wool by that amount, so where seed is light and confined to the edges of the fleece by all means remove it.

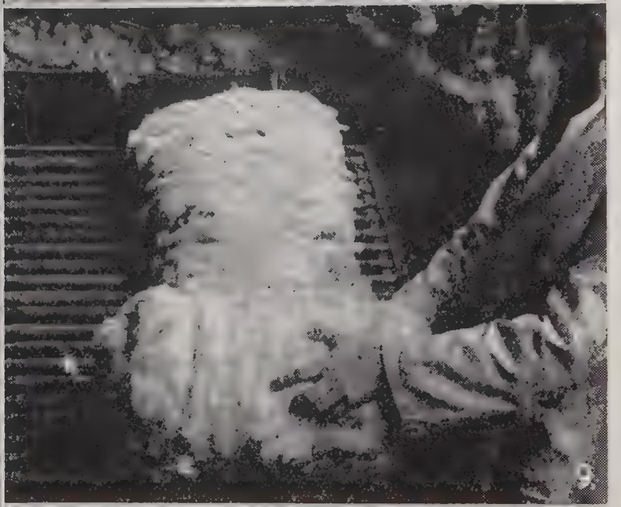
Again, if the fleece is seedy throughout, skirting heavily will not remedy the position, and the amount of wool taken off is then determined by other factors, such as stain and dirt. Also, it must be remembered that where seed is confined to a few fleeces throughout the clip the skirtings from these should not be mixed in with the free skirtings from the rest of the clip, or they will reduce the value of the whole lot by as much as 2d. per lb., or more.

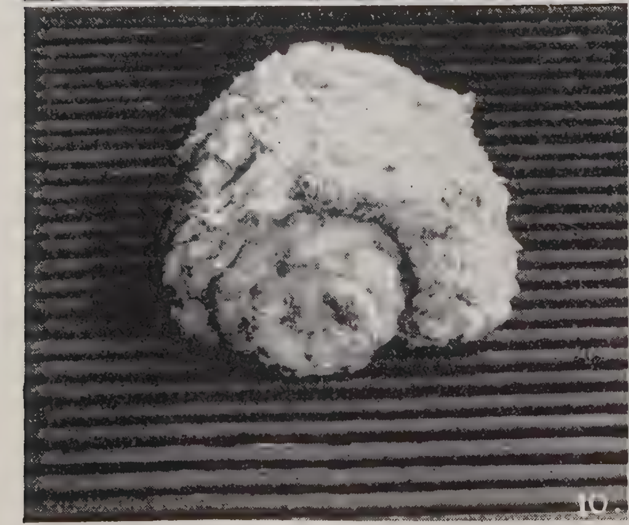
4. The fourth point does not apply just now, as all our wool is being bought on a fixed-price schedule, but when prices are very low heavy skirting is obviously not worth while,











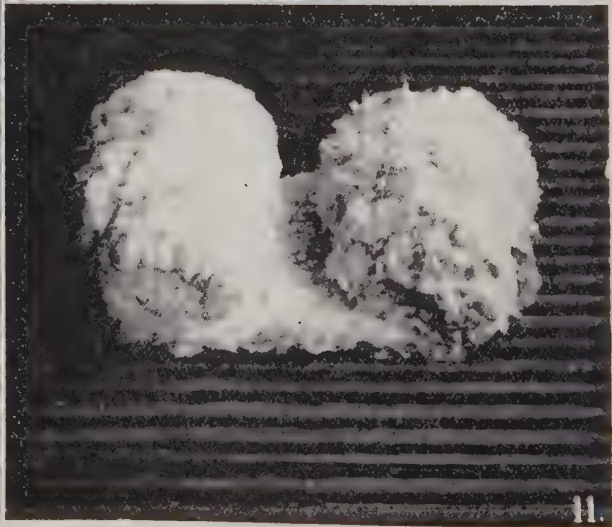


Fig. 6.—The skirted fleece ready for rolling. Fig. 7.—The first fold. Fig. 8.—The second fold. Fig. 9.—Rolling from britch to shoulder. Fig. 10.—The finished product. Fig. 11.—Another method recommended only when the wool has to be unrolled again in store.

as the resulting increase in value of the fleece wool will be small and the value of the skirtings so low that the more wool that goes into this category the lower the over-all returns. Nevertheless, even under these conditions it is still necessary to do a certain amount of skirting, to remove wool which is very much inferior to the rest of the fleece.

1st and 2nd Pieces

It will be noted from Fig. 5 that the skirtings are divided into several sorts. Starting from the neck, it will be seen that a small amount of wool is usually removed in this region, because it tends to be light and weathered. This wool is not always kept separate—in fact it is sometimes run in with the 1st pieces, but if there is a quantity, it is worth keeping it separate, for because of its lighter condition, its value is greater, by as much as 1d per lb., or even more, according to circumstances. On the other hand, the neck is often seedy, which is another reason why it should be kept separate.

The 1st pieces consist generally of all the wool removed along the shoulders and flanks, with the exception of the small area behind the armpit. This goes into the 2nd pieces, because of its shortness, dirty nature, and heavy condition. Do not skirt more heavily than necessary in the shoulder region; remove just the dirty edges, as the shoulder is generally the best and most valuable portion of the fleece.

The coarser, matted, and dirty wool on the points is all removed, and, together with the coarser fringe from the britch, goes into the 2nd pieces. The amount of wool which requires to be removed from the britch varies a good deal, but in some cases it will be found that this wool is markedly coarser than the rest of the fleece, and frequently hairy as well, so that it is better to remove any wool of this type completely.

Stains, etc.

There is frequently a stained area in the centre of the britch, and, if this is pronounced, it is better kept separate, as it will detract from the value of the 2nd pieces. If there is any quantity, it can be run in with the stained wool that should also have been picked out from the bellies, and can then be sent in to the broker for binning. Provision is made for this type of wool in the Bareme under the category "Stained Pieces."

Occasionally it is also necessary to remove a strip of wool from along the centre of the back where it is very earthy or sandy, as it will detract a good deal from the value of the fleece if left in. If the brand is still showing, it should either be removed entirely, which is the safest and quickest way, or else the pigmented portion should be clipped from the end of the staples with a pair of shears.

Bellies

Belly wool is normally pulled off by the shearer, and is then kept separate from the rest of the fleece wool and oddments. Leaving the belly on a fleece of average to good quality is simply throwing money away, and where any quantity of wool is being handled it is also a mistake to mix in bellies with pieces, because of the heavier condition and lower value of the former, average Crossbred bellies being worth anything from 1d. to 3d. a lb. less than the corresponding 1st pieces. Where the quantity justifies it it is a wise plan to pick over the bellies and remove all stained and very heavy conditioned portions, because these detract considerably from the value of the whole line.

Locks

These are the lowest grade of wool in the clip, and, unless the quantity is very large, will seldom justify any special treatment. They consist mainly of short bits of wool, fribby greasy locks, and short second cuts, which fall through the slats of the wool table. Short dirty floor sweepings should also be included with the locks.

Skirting has been emphasised because it is important. When it is worth doing at all it should always be done at shearing time in the owner's shed, because then the fleece is in the most favourable condition for doing the job properly. Once the fleece has been rolled the original arrangement of the staples is to some extent altered, and after unrolling in the broker's store efficient skirting is no longer nearly so easy.

On a small property all the lines of oddments mentioned above will not be made, and the wisest and most profitable plan is often to send in the oddments, along with numbers of cast fleeces which will have accumulated, to the broker for binning. Keep the fleece wool, the bellies, and the remaining oddments separate. This can be done by placing them in separate bags, or, if they are all in one bale, by placing pieces of sacking, or even brown paper, between the different lots to separate them.

Rolling

Rolling the fleece before pressing is practically universal today, although this has not always been the case. Rolling should serve two main functions—firstly to reduce the fleece to a compact form for easy handling, and secondly to give it an attractive appearance. Strangely enough, some of the methods of rolling practised in this country do not achieve the latter objective. It is a business axiom that the vendor should display his goods in the most attractive manner possible; therefore it is not dishonest for the grower to roll his fleeces in such a way that the best wool is showing. It will not deceive the appraiser, with his wide experience, because he can easily find the bad wool if he wants to, but it will ensure that the best wool is not overlooked. In general, the shoulder wool is the best part of the fleece, and the back wool and britch the poorest.

There are several methods of rolling, but the two described below are actually all that are required, depending on what is subsequently to happen to the wool. If the fleeces are properly skirted on the farm, they do not have to be unrolled again in the broker's store, even if they have to be classed or binned when they arrive there. In that case the following method is recommended:—

Method No. 1.—Fig. 6 shows the skirted fleece lying on the table ready for rolling. The following operations are now carried out in sequence:—

1. If it is not reasonably square across the neck and britch, a little can be folded in at the two ends to make it so, and also the near edge of the fleece can be folded in a couple of inches to make it straight, although this is not essential.
2. Fig. 7 shows the next step. Fold the fleece over about a third of its width towards you; this gives a strip of wool lying "flesh-side" up.
3. Now fold this doubled portion over again towards you on top of the remaining third, as shown in Fig. 8. The fleece is now lying ready for rolling, with the back wool on top, running as a strip down the centre.
4. Begin at the britch and roll the fleece tightly all the way to the shoulder, as shown in Fig. 9.
5. The finished roll is shown in Fig. 10. It is neat and compact, and will stand quite a lot of handling without coming undone.

Reference to the diagram Fig. 12, E, F, G, and H, shows clearly that by this method the back and britch wool is rolled in and the shoulder wool is displayed to best advantage.

Method No. 2.—When skirting is not done on the property (although ample reasons have already been given why it should be done there) the following method should be adopted:—

Proceed as described in the first method up to stage 3, where the fleece is folded into a narrow strip as shown in Fig. 8. Then, instead of rolling from britch to shoulder, roll from **both** ends so that the fleece ends up as shown in Fig. 11. This has the advantage that the fleece is very easy to undo in the wool-store, and it is not torn about in the process. After it has been skirted it can be rolled again by method No. 1.

Methods Not to Use: The top portion of Fig. 12 shows one of the methods **not** to use if the wool is being finally rolled on the farm. The figure marked A represents in diagrammatic form the skirted fleece ready for rolling. If it is then folded in as shown at B, or the other method shown at C, and rolled as at D, practically all the best shoulder wool will be hidden and the strip of inferior wool along the back will be plainly displayed. The method shown on the lower part of the diagram (E to H) is no more trouble to carry out, and is much more effective in presenting the best wool.

A method practised by some farmers and often described as the "shoulder-roll" is carried out by folding the fleece as at B (Fig. 12), with the exception that the shoulder end is left more or less spread out. The fleece is then rolled from the britch, and when the shoulder end is reached this portion is more or less "draped" over the rest of the fleece. It certainly shows this part to advantage, but makes the fleece very difficult to unroll later on, and should never be used where the fleece will have to be unrolled again in the store.

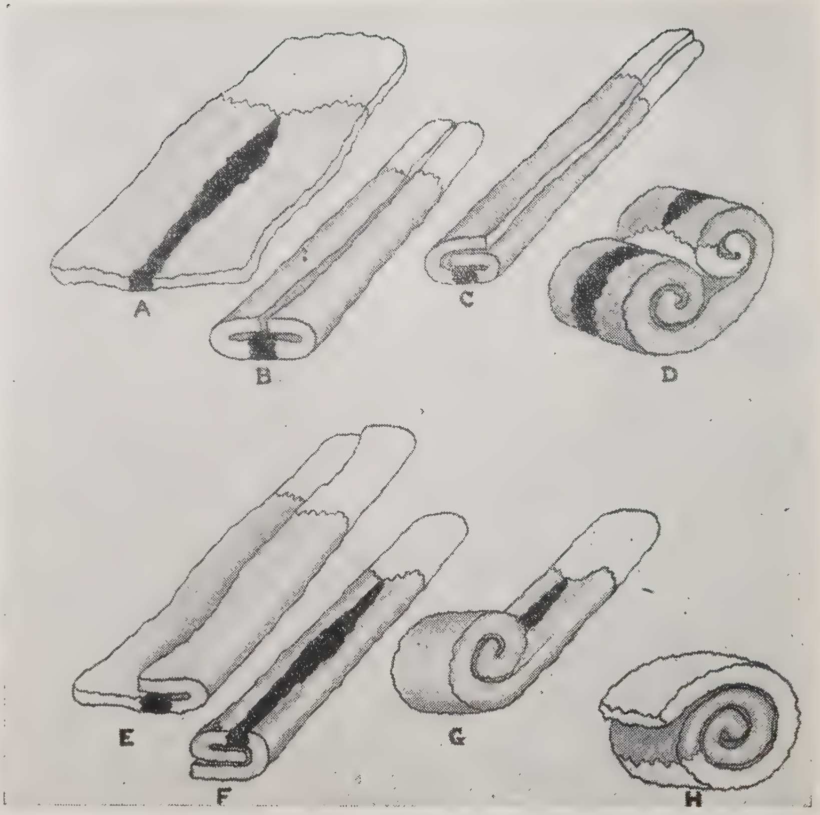


Fig. 12.—Different methods of rolling: The white portion represents shoulder wool, the grey portion the bulk of the fleece, and the black strip the inferior wool along the back.

WOOL CLASSING.

The scope of this article does not allow for any lengthy discussion of classing, and it is proposed to outline a few of the main principles involved rather than to attempt to fill in the details.

The aim in classing is to divide the clip into the minimum number of lines with the maximum difference between each. Over-classing is definitely to be avoided, as it will result in the making of a number of "star lots" (lines of less than 4 bales), which in pre-war days usually suffered in price, and today are still not regarded with favour by either the brokers or the appraisers, even though they now receive full market value.

The fundamental principles of classing are to divide the clip up as far as possible according to:—

(a) Types of wool from a manufacturing point of view; and

(b) Types of wool according to value.

These two considerations are in most cases inter-related, although the first is usually of major importance.

(a) The Bareme recognises the manufacturing aspect throughout, first of all subdividing the wool into major groups (such as fleece, pieces, etc.), next according to fineness (counts), then according to length (Preparing and Carding types), and lastly according to grade (AA—E). These divisions take into account the manufacturing aspect in every case. For instance, one of the major divisions of the wool manufacturing industry is into the "woollen" and "worsted" trades. Both use wool covering a wide range of spinning counts (fibre diameter), but there the similarity practically ends. In other characteristics the two sections of the trade have totally different requirements in the way of raw material. **In general,** the woollen trade uses the shorter and lower grade sorts of wool, and employs a relatively small number of processes in conversion from fleece to fabric, turning out utility goods usually at a fairly cheap price. The worsted trade, on the other hand, requires longer and sounder wool of generally better quality, and puts it through many processes before finally converting it to fabric. One of these processes—which alone is sufficient to distinguish the worsted process from the woollen—is that of combing. Combing serves to lay the fibres parallel and remove short, wasty, and broken ones as "noils." That is why tender wools and those containing a proportion of cotts and/or short stapled portions are

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unsuitable. The ultimate effect is shown in a smoother and stronger yarn, which in its turn gives a different type of fabric of superior quality.

In general worsted materials are of better quality, different construction. and dearer in price than woollens. The worsted trade may be further subdivided on the basis of its raw materials into Preparing and Carding sections. The Preparing section uses different machinery in the initial stages to deal with the longer Preparing wools, while the Carding section is fitted up to deal with the shorter stapled Carding wools.

In addition to these main divisions specialty wools are required for certain purposes, e.g., the "paper felts," which are given a special section to themselves in the Bareme. As their name indicates, these wools are used for making special felts for the paper-making industry, and must be of good length and absolutely sound. Without elaborating further, it can thus be seen that if wool is classed according to its future use in industry, it will fetch more than wool of very varied type, because in buying the latter the manufacturer receives a proportion which he either doesn't want at all, or which is of inferior value as far as he is concerned.

(b) In regard to the second division—according to price—this runs all through the Bareme, and is superimposed on the first grading, mentioned above. It is influenced by the kind of wool—fleece wool is worth more than crutchings; by the fineness—70's fleece is worth more than 48's fleece; by the grade—A is worth more than C; and by the yield—a given wool yielding 78 per cent. is worth more than the same wool yielding only 72 per cent.

It will thus be seen that wool classing is not the mysterious process it is sometimes made out to be, but is largely the application of certain well-defined principles along with a good deal of common sense. Where a large clip is involved there is plenty of scope for classing if the wool involved tends to be mixed; but with the average crossbred clip the size does not allow more than two, or at the most three, main lines to be made. Where a clip is so small that proper classing on the farm is impracticable, the system of binning as carried out by any reputable woolbroker offers the best solution. Under this system the smallest quantities of wool (even a single fleece) are correctly graded and sold to the best advantage, as part of large, well-graded lines.

In medium-sized clips it is often possible to class the bulk of the clip on the property, and send in the oddments for binning. This is better practice than having them interlotted by the broker. Interlotting is merely a makeshift grouping of similar bales to avoid the selling of "star lots." It seldom pays, except in the case of very large clips, to attempt to make "super" lines. It is better to leave this good wool in the top line, to enhance its value, rather than to skim off the "cream," consisting of perhaps two or three bales, to make the super line. Also, avoid the practice of "forcing," that is, putting a fleece into a higher line than that to which it belongs.

Adequate facilities are necessary to carry out good classing, and first and foremost among these are good light, plenty of space, and an adequate number of bins in the woolroom.

Examples

The following are examples of the lines to be made in some typical New Zealand wool clips of moderate size, **but it must be emphasised that no really hard-and-fast rules can be laid down,** as every clip must be treated on its merits. In Merino wool length is of relatively greater importance than in the case of Crossbred wool, where length is usually adequate and count is of primary importance. Condition is also a greater consideration with Merino than with Crossbred clips.

Merino Clip:

AA. Comb. (Fine Merino).—64/70's count. Consisting of all the longest, soundest, and brightest wool, not too heavy in condition.

A. Comb. (Medium Merino).—60/64's count. Ditto. Ditto.

B. Comb. (Strong Merino).—58/60's count. Ditto. Ditto.

M. Clo.—58/70's count, consisting of all the wool similar in description to the above lines, but lacking in length.

M.—58/70's count, consisting of all the heavy conditioned and fatty fleeces in the clip regardless of length.

Halfbred Clip:

AA.½B. (Fine Halfbred).—56/58's count. Good length and all the soundest, brightest, and lightest wool of these qualities.

A.½B (Medium Halfbred).—54/56's count. Ditto. Ditto.

B.½B. (Strong Halfbred).—50/54's count.

½B.—50/56's count. All fleeces lacking in length and heavy in condition.

Crossbred Clip:

AA.XB. (Fine Crossbred).—46/50's count. Sound, good length, and colour, free from seed.

A.XB. (Medium Crossbred)—44/46's count. Ditto. Ditto.

B.XB. (Strong Crossbred).— 40/44's count. Ditto. Ditto.

Cast lines may be made, if necessary, to take care of extra coarse fleeces, fleeces from the above lines showing a break, or fleeces unduly short in staple. These can all be binned. The above grading applies to medium-sized clips, and in the case of larger clips any or all of the lines mentioned can be subdivided as may be necessary. E.g., the top line might be subdivided into 46/48's and 48/50's. Other subdivisions could be made on the basis of colour and condition.

Keep all hogget wool separate from the rest of the clip, and keep cotted fleeces and very heavy conditioned and discoloured fleeces separate. In the case of tender or seedy fleeces, if there are only a few, keep them separate, but if the whole clip is affected, disregard and class as if these faults were not present.

In clips where the proportion of inferior wools, such as stained and dingy, are not high the best way of disposing of this wool is to have it binned, but where the inferior grades form a considerable proportion they can be made into one or more cast lines. The same principles of treatment and disposal apply to the oddments, such as necks, pieces, bellies, locks, etc.

Bushel Measure

The imperial bushel introduced in 1826 is a measure of capacity, not of weight, although now it is common trade practice to buy and sell grains, some feeding stuffs, and ryegrass seed according to an accepted reckoned bushel weight, rather than by a capacity measure. The imperial bushel has a capacity of 2,218.2 cub. in., which is the volume occupied by 8 imperial gallons or 32 quarts.

Accordingly a 4-gal. petrol tin makes a useful ½ bushel measure, while the standard bushel apple case 18in. x 11½in. x 10¾in., the volumetric measure of which is 2,225 cub. in., contains for all practical purposes one bushel.

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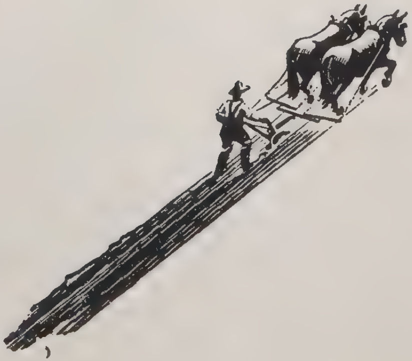

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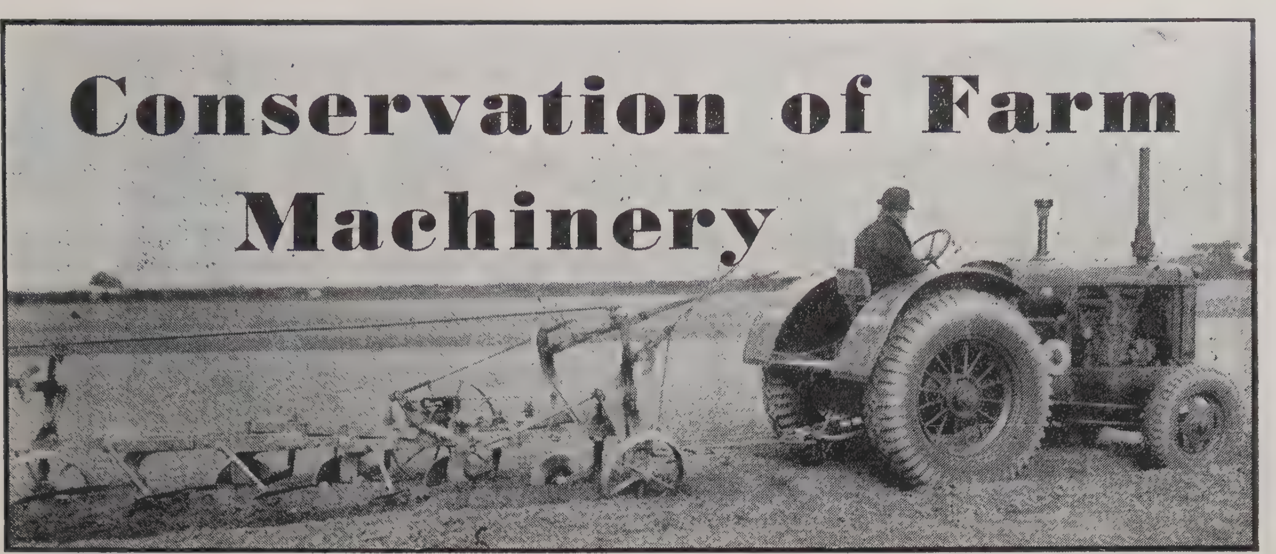

Tractor Ploughs

Tractor ploughs, like all implements, need proper maintenance and care, if they are to perform their job satisfactorily. One day will usually suffice for the complete overhaul of a plough on the following lines. Such a chance may come during a wet day in harvest, and the plough will then be in order for the autumn work.

Checking Beams

A GREAT number of the less obvious plough-setting difficulties are due to ploughs being out of alignment. A tractor plough consists of a number of beams which, together with the brackets and braces, form the frame of the plough. Each beam, on ploughs of two or more furrows, carries a plough body. No plough will do satisfactory work unless the beams are true, the whole frame is true, and each plough body is in the same position, relative to the others, as it was when the plough was new.

It is important, therefore, to check over a plough periodically to make sure that it has received no damage from rocks, tree roots, or general carelessness during use. This should be done where possible under cover, and on a level concrete floor.

(a) Vertical distortion: Put on a set of new shares, and after seeing that they fit properly measure from the underside of the beam to the underside of the share (4in. back from the point) on each plough body (see Fig. 1a). This measurement, known as the "pitch measurement," should be the same on all bodies. On some makes of plough there is individual adjustment for this at the back of each of the bodies (see Fig. 1a).

Where **pitch adjustment** is provided the measurement should be adjusted if necessary to the standard figure for that particular plough as specified by the makers. Small bends in the rear of the beam can be corrected in this way; but should there be insufficient range of adjustment to do this, the beam is seriously bent, as in Fig. 1b. When there is **no pitch adjustment** on a plough any difference in pitch measurements between bodies means that the beam is bent (see Fig. 1b).

When each plough body carries the same amount of pitch the plough should be "level underneath." That is, the **underside** of all share points should be in line. This can be checked by sighting or using a straight-edge along the underside of the share points (see Fig. 2).

If any one share is out of line, the beam is bent or is out of line in the frame of the plough (see Fig. 3). Place a straight-edge across the whole plough in as many places as possible. If a beam is below the level of the others it is an indication that the frame of the plough, rather than the beam, is out of true. With a 2-furrow plough a rough check can be obtained by sighting across both beams to see that they are in line. For a more accurate method place two straight-edges with parallel sides across different parts of the beams. If the upper surfaces of the two straight-edges are not in line, the frame of the plough is bent.

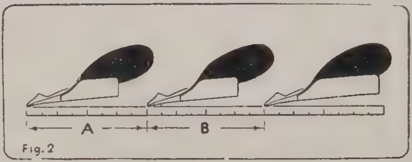

Fig. 2

As an additional check the ends of the share points should also line up on the straight-edge.

(b) Lateral distortion: The beams should be checked for distortion by twists or bends down their length, particularly in the rear part. This can be done in any of the following ways:—

(i) See that the **landside edges** of all share points are equally spaced (see Fig. 2, measurements A and B).

(ii) Drop a plumb-line from the nearside edge of each beam and see that it touches the share below at the same distance from the landside on each body (see Fig. 4, measurement

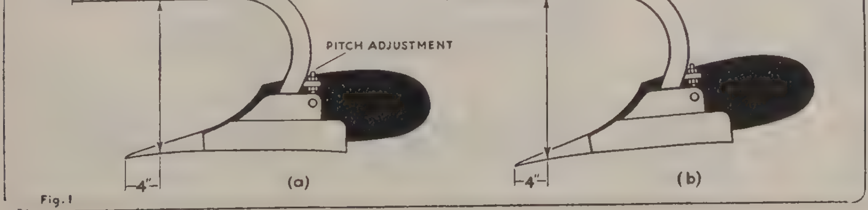

Fig. 1

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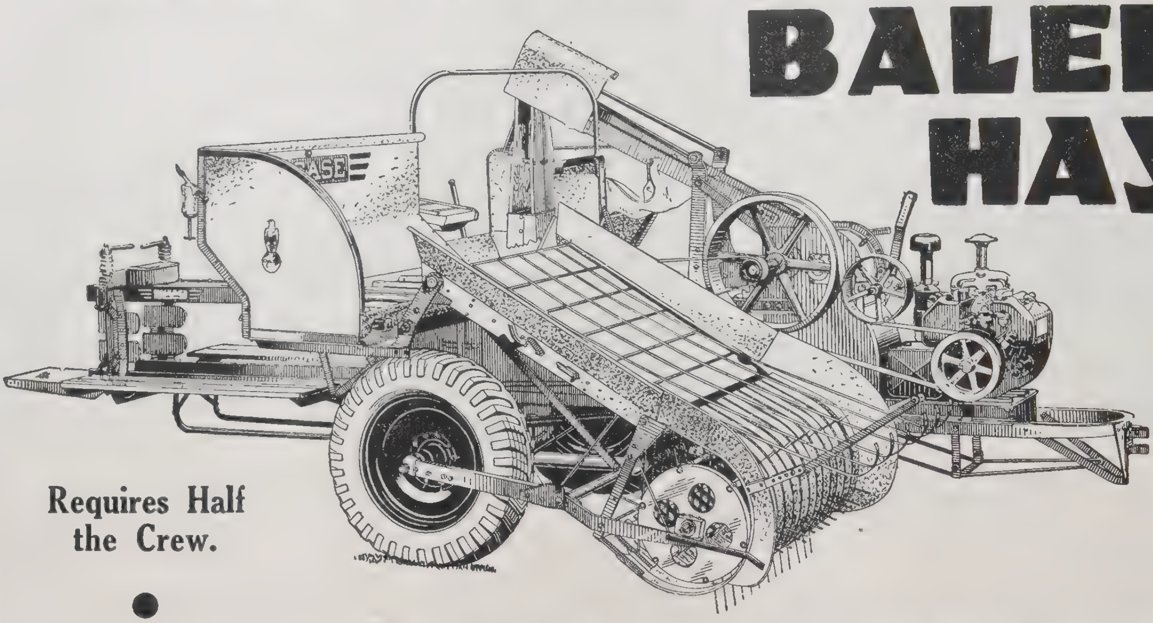

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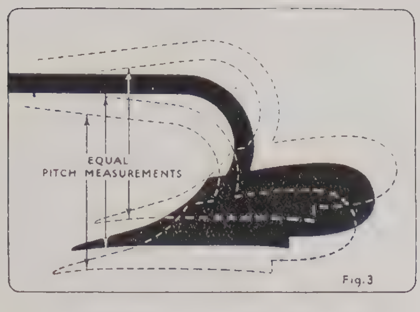

Fig. 3

C). This can be done roughly by sighting the edge of each beam against the landside below.

(iii) The most accurate method is to lay a straight-edge along the landside of each body and, using that edge which touches the landside, draw lines on the floor as far in front or behind the plough as possible. Repeat this process on each plough body (see Fig. 5). If the plough is not strained, the lines so drawn will be parallel and equally spaced. Any line that is not parallel with the rest indicates that the beam of that body is bent or twisted.

When not on a surface where lines can be drawn string may be used. A small loop in one end of a length of about 10 or 12ft. is slipped over the point of the share and the remainder is stretched tight so that it just touches the heel of the landside. A string from each body can then be pegged in this position and measurements taken as above.

N.B. The use of new or only slightly worn landsides leads to greater accuracy.

Correcting Distortion

If any great amount of distortion is detected, the offending beam should be removed and returned to the makers or replaced by a new one. It is nearly always impossible to straighten a plough beam by ordinary smithing methods so that it retains its shape during further use. If the whole frame of the plough is out of shape, the plough itself should be returned for overhaul.

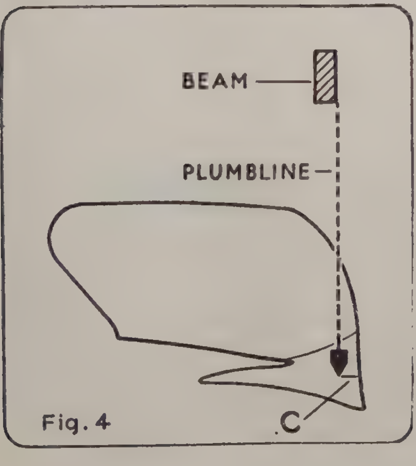

Fig. 4

Where distortion is not too great some correction can usually be made in one of the following ways:

(i) **Pitch.** Where pitch adjustment is provided it can be varied slightly on each body until the plough is "level underneath." On ploughs with no adjustment wedges may be inserted between the front of the beam and the body when the bolts are slack. In this way small vertical errors in alignment can be corrected.

(ii) **Frame.** A strong bar or brace clamped across the rear of the beams while the frame bolts are slack may pull a plough into shape. On some ploughs adjusting devices, usually in the form of cam nuts, are provided in the frame brackets, in order to allow the frame to be trued up.

(iii) **Beams.** Packing, in the form of washers, thin plates, etc., can be inserted between the beams and brackets, and between the plough bodies and the ends of the beams, until the correct measurements are obtained, as in Figs. 2, 4, and 5.

Bodies

Shares of the peg-on type should be tested to see that they are a tight fit on the plough bodies. If they are loose it is usually a sign that the plough has lost a share during work, and has gone some distance before it has been noticed. It needs only a few

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yards without a share to damage a body so that shares will no longer fit. Bodies damaged in this way should have the underside of the nose built up again to the correct size by welding. It is far better, however, to avoid this trouble by exercising care in backing ploughs and by keeping a strict watch to detect the loss of a share as soon as it occurs.

As a temporary measure in the field shares for a plough body damaged in this way should be packed on the **underside,** in order to take up the slackness.

Mouldboards

The final setting of the mouldboards of a plough can be done only during work. In the course of an overhaul they should all be set to the same measurement, so that later on, if the same adjustment is made to each one, they will still be at a uniform setting. Place a straight-edge along the landside of each body and measure at right angles from this to a fixed point on the mouldboard. This measurement should be adjusted so that it is the same on all bodies.

In addition, the mouldboards should all be at the same level. Lay a straight-edge along the top of them, and see that it touches each one. On some ploughs there is adjustment to give this, but on others the mouldboard stays may have to be bent or their holes filed out, in order to obtain the necessary adjustment.

Wheels and Lifts

Remove the wheels and wash the bearings in paraffin to remove the old grease, which will contain grit. Any end-play can be taken up by turning the castellated washer on the end of the axle, so that the pin goes through another notch. The wheels themselves should be examined to see that the hubs are located firmly in the wheels. Slackness can be taken up on the large hub-retaining nuts if these are fitted. If the bearings are very worn, or the lugs on the hubs broken, the hubs should be replaced. If only the lugs are worn, however, they can be made to fit again by being built up by welding. Pack the hub caps with fresh grease before replacing the wheels.

If the plough has a hub lift, this should be cleaned when the wheel is off. Remove any dirt, wash the whole lift in paraffin, and allow it to dry. Before replacing the wheel the bearings of the roller and locking bar only should be greased. Rack lifts should have the locking mechanism cleaned down with paraffin before oiling it lightly.

Disc Coulters

Dismantle all coulter bearings and clean them in the same way as the wheel bearings. If they are slack and adjustment is provided, they should be tightened until the disc just spins freely. If there is no adjustment, badly-worn bearings will have to be renewed. Pack the bearings with grease before reassembling the coulters.

Wearing Parts

All worn parts, such as coulters, mouldboards, and landsides, should be replaced before damage is done to the plough. If, for example, a landside is not replaced soon enough, the plough body may become damaged.

It is also important to check over any stocks of spare parts, especially shares, to see that those likely to be needed are either in stock or on order.

Finally, now, and before each day's work, the plough should be greased round thoroughly, and all nuts looked over to see that they are tight. A plough travelling or at work is in a state of constant vibration and nuts are very liable to work loose.

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During Work

Safety Hitches: Whenever a safety device is provided in a plough hitch it should always be used. If there is a hole for a shear-peg in the drawbar, use in it a sound hardwood peg **and not a bolt.** When spring safety hitches are fitted they should not be adjusted so tightly that they cannot release when an obstruction is met. This is especially important on land containing roots, or in rocky land when it may be necessary to fit steel shares to avoid breakages.

Share Pegs: It is a common mistake to cut share pegs from green wood growing in a hedge. They should be made from seasoned, straight-grained wood. (Hay sweep tines are very suitable.) Cut blocks about 3in. long **across the end of the grain** and split out the pegs as they are needed. If a peg is not strong enough when made in this way, a 2in. wire nail can be driven down the centre to reinforce it, and the peg will still be easy to drive out.

Crawler Tractors: When ploughing with a crawler tractor the swinging drawbar **must not be fixed.** The range of swing may be limited by two stops to help in turning on the headland; but the drawbar must be free to swing clear between the stops when the plough is in work.

Speed: The best ploughing, particularly on grass land, is done at less than three miles an hour. It is always better to use one furrow more and one gear lower on the tractor than one furrow less and one gear higher. On light stubble or fallow land, where a quick seed-bed is needed, higher speeds may occasionally be more suitable.

Turns: Great care should be exercised in turning ploughs, and particularly the large ones, on headlands. Start with a wide enough headland so that an easy turn can be made, and so avoid the bending of axles and hitches that takes place when a plough is turned too short. The same care should be used when turning ploughs in the ground during the ploughing of the headland. All corners should be tackled slowly and acute turns rounded off.

Shares: Avoid backing a plough unless it is absolutely necessary, and before restarting make sure that all the shares are still on. Share bolts should be checked over during the day to see that they are not working loose. If they do, the plough body may become bent, and the pitch measurement on that body will have been altered.

Finally, the plough should be greased round every day and the disc coulters twice a day. At the same time a watch should be kept for loose nuts so that they can be tightened at once.

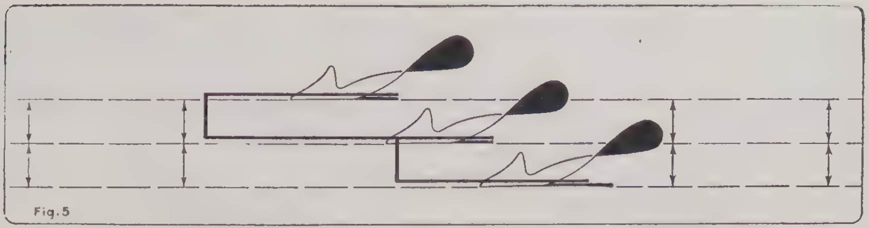
Fig. 5

After Work

Whenever a plough is left for a period of time, even overnight, all bright parts should be protected by a coating of used sump or transmission oil. If a plough is allowed to become rusty, the draught in heavy, wet going may be doubled until the mouldboards begin to shine and scour. It is no protection against rusting to leave a plough in the ground.

Transport

Whenever possible ploughs should be moved over long distance on a trailer. On no account should they be towed on the roads at high speeds behind a lorry or rubber-tyred tractor. Before a journey the wheel bearings should be greased thoroughly, and the plough then towed at a speed not greater than three or four miles an hour.

Before a plough is taken on the road any spuds should be removed from the land wheel, and the shares of the peg-on type should also be removed if the pegs are not absolutely safe.

Storage

If a plough is to stand idle for any length of time, used sump oil or transmission oil is not persistent enough to protect the bright parts from rust. They should be greased thoroughly all over with a stiff grease. For a longer period still grease may not be good enough, and there are a number of anti-rust preparations supplied by lubricating oil manufacturers which give more lasting protection.

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Measurement of Timber

Timber is usually sold on a superficial feet basis. The number of super. feet is determined as follows:—

$$\frac{\text{Width of board in inches x thickness in inches}}{12} \text{ x length in feet.}$$

For example a board $\frac{\text{12in. x 1in.}}{12}$ x 100ft.

= 100 super. feet.

It may also be sold per running foot, or per cubic foot. The cubic footage is obtained by multiplying together width, thickness, and length.

For example a board 12in. x 1in. x 100ft. $= \frac{12}{12} \text{ x } \frac{1}{12} \text{ x } \frac{100}{1} = 8\frac{1}{3}$ cubic feet.

In the case of logs of approximate circular form the cubic content may be measured as follows:—

$$\frac{\text{Diameter of butt in ft. plus Diameter of small end in ft.}}{2} = \text{mean diameter.}$$

Cubic contents = mean diameter squared x .7854 x length in ft.

Example: A log 3½ft. diameter at butt, 2½ft. at small end, and 20ft. long will contain the following cubic footage:

$$\frac{\text{Diameter butt end } 3\frac{1}{2}\text{ft. plus Diameter small end } 2\frac{1}{2}\text{ft.}}{2} = \frac{6}{2} \text{ or 3ft. mean diameter.}$$

$$\text{Cubic contents} = \frac{3}{1} \text{ x } \frac{3}{1} \text{ x } \frac{.7854}{1} \text{ x } \frac{20}{1}$$

= 141.4 cubic ft.

Firewood, 1 cord = 8ft. x 4ft. x 4ft. or 128 cubic feet.

Because of the interspace between logs 80 cubic feet of actual wood and bark is a fair average per cord of wood.

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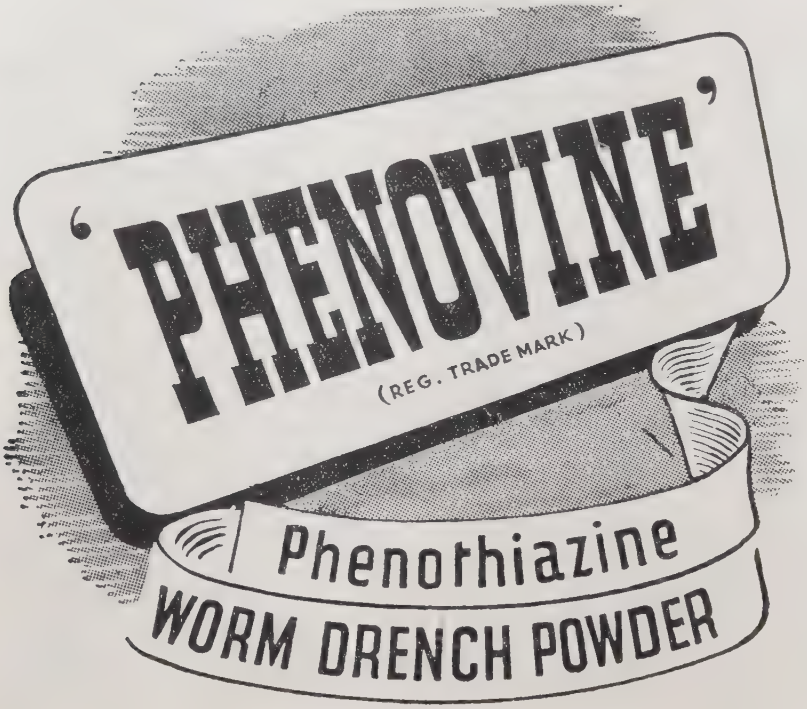

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Veterinary Notes for the Farmer

Feeding Garbage to Swine

THE feeding of garbage or swill has been a general practice amongst pig fatteners for many years, particularly in the vicinity of the main cities and towns. This article refers more particularly to feeders of garbage who mainly buy store pigs for fattening, and also in a few cases to those who breed their own requirements, working under the sty system with no other by-products such as skim milk, etc., and with no run-off to pastures (intensive sty system).

More Garbage Fed

Until recently garbage has been fed in various ways—boiled, semi-cooked, and just as collected. Since the outbreak of war and the establishment of camps throughout the country the feeding of garbage has greatly increased in the pig-fattening business. Camp garbage on the whole is a much better quality food than that received from public hospitals and restaurants. Some of the garbage from the latter source is of an inferior quality, having been cooked and re-cooked, and generally well mixed up with all refuse from the kitchen. Being again boiled on the farm this class of garbage will ferment quickly. To avoid dietetic trouble from this source the garbage should be fed immediately after cooking. Another important point to watch is that all foreign articles, such as tins and razor blades, are removed before feeding, as deaths have been caused by their inclusion in the food.

Collectors of garbage can avoid a considerable amount of this trouble by making suitable arrangements with those in charge at the various camps and sources of supply.

Must be Boiled

Under the Stock Diseases Regulations, 1937, Amendment No. 1, it is now necessary to boil all garbage before feeding to swine by heating to a temperature of 212 degrees Fahrenheit and maintaining at that temperature for not less than one hour. These regulations were framed mainly to prevent any possibility of contagious swine diseases developing in this country. Any person desiring to feed garbage to swine must first make application for a permit under these new regulations. Before a permit will be granted the applicant must have a suitable plant in which to treat the garbage handled daily.

It has been the custom of some pig fatteners, for years before these regulations came into force, to boil garbage, and they are firmly convinced that this method gives a much better feeding value than unboiled garbage. On the other hand, some fatteners state that they get equally good results from garbage fed as received at the source of supply. Nevertheless, they all agree that the boiling in cold weather gives very much better results. In some cases pigs fed on uncooked garbage do not take readily to it when boiled, but a little education in connection with the new food quickly overcomes such early difficulties.

Too Much Fat

Mortality from garbage feeding has been reported from some piggeries. Investigations show this to be due to an excess amount of fat in the feed; when this was skimmed off and water added no further trouble was experienced. When garbage is cooked all fat contained comes to the surface; when cooling takes place this sets, and should be removed before feeding, otherwise digestive troubles may develop. In other cases, more particularly young pigs with the sow, the food being fed was too rich, resulting in scouring, with some deaths; diluting the feed with water corrected this condition.

Good, clean garbage is an excellent pig food, and even under the adverse housing conditions of piggeries in general it leaves no doubt in this respect of the feeding value. I have seen poor, miserable store pigs bought by garbage feeders, and inside a short period they are in excellent condition for fattening. In buying stores not used to this class of feed, care needs to be exercised until they become accustomed to it. This is a very sound practice in general, as sudden changes in the system of feeding are the causes of many digestive troubles.

Plenty of Water

When feeding garbage with no other liquid foods plenty of water is required with it. Some successful pig fatteners feed as much as 50 per cent. water. Under this system of feeding pigs have graded very well. Water appears to be the main corrective when only garbage is fed. A good quantity of water is added while the garbage is boiling.

With steam-generating plant garbage is not so readily burnt as where boilers are used; these have to be carefully watched. A false bottom in the boiler considerably eliminates this trouble.

W. J. COOPER, Inspector of Stock, Auckland.

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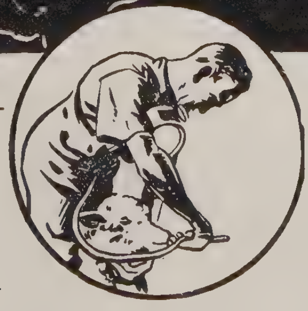

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Breech Births and Dead Calves

"H.E.," Mercer:—

One of my cows, a big Shorthorn of about 10 or 12 years, had in 1941 a breech birth. The following two years (1942 and 1943) she calved normally, and also in the preceding two years (1939 and 1940). After she calved in 1941 she got rather stiff in her hind legs, which condition remained for several months. Today she calved again with a breech birth. I had to pull the calf out. The calf was dead. I would like to know what causes a breech birth, and is it hereditary? I have reared three daughters of this cow; one born in 1940 gave no trouble in this respect, but one born in 1942 had her first calf a month ago, a dead one, and she might have had the same trouble, although I did not see her actually during the delivery. The third daughter is a yearling.

LIVESTOCK DIVISION:—

No information is available as to what factors operate regarding the position taken by the calf before birth. There is nothing to indicate that any of such positions are hereditary. In cases of breech presentation it is necessary to make delivery as quickly as possible, otherwise the calf will suffocate.

◆

Removing Afterbirth From Heifers

"R.C.H.", Halcombe:—

Could you advise me as to the best method of removing the afterbirth from cows? I have two heifers, both in very good condition, who have not cleaned. Is it advisable for me to try to take the afterbirth away? Should I wash the heifers out twice a day, and what is a satisfactory disinfectant to use?

LIVESTOCK DIVISION:—

It is advisable to remove the afterbirth if not cast by 48 hours after calving. This is done by inserting the arm, well greased, into the uterus and removing the membranes from the cotyledons (buttons) individually. Hook the front finger round the membrane close to the button and gently pull it away. Take care not to tear off the button. Keep a bucket of some reliable disinfectant handy and keep dipping your hands into it at frequent intervals. This should prevent any chance of your getting blood poisoning from the decaying membranes.

Wash out the heifers with a weak, warm solution of Condy's crystals twice daily until all discharge has ceased, and thoroughly wash the hind quarters each time.

You could get a blood sample from each heifer examined at Wallaceville Veterinary Laboratory to see whether you have cases of contagious abortion in your heifers.

◆

Wart-like Growths on Young Cattle

"T.L.L.", Kaipara Flats:—

We have a heifer which some time after weaning we noticed had a large number of grey, wart-like growths on face, chin, and neck. She was running with other heifers, but was the only one like that. The growths became large, but the heifer was in good condition and bright, and now she is a two-year old the growths have disappeared. Several of this last season's weaners, however, appear to have the same thing. One has it on her tail. It appears to annoy them at times. The growths on some of them stick out or hang down more than 1 or 2in. Could you advise us as to cause, treatment, etc.?

LIVESTOCK DIVISION:—

The growths on your heifer are most likely what are commonly known as "warts." Their actual cause is not known. One animal alone is often affected in a herd and, although it may remain affected for a year or more, the trouble may then completely disappear without any treatment whatever. If treatment is desired the application of washing soda daily either by rubbing in with the crystal itself or by painting on a strong water solution of the same will give satisfactory results. Care must be taken that sensitive parts such as the eye are safeguarded from the application.

◆

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Quick—Humane—Sure.

No Severe Setback.

Lambs Fatten Earlier.

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SAVE MORE HAY

Save as much hay as possible in the summer of 1944-45: greater hay production means better winter feeding and increased dairy production in the 1945-46 season.

★ Cut only as much hay at a time as can be properly handled during the curing stage by the machinery and labour available.

★ Cut at flowering stage when the greatest weight of nutritious material will be obtained.

★ Provide adequate protection of the hay in stack or bales from the weather.

Seasonal Notes - - The Fields Division

Haymaking

Soon farmers will be cutting the early hay crops, for there is a fair chance of obtaining good haymaking weather during the last week of November, and as good, or better, chance of settled weather in early December as in late December. Since the quality of the grass rapidly declines as the grass grows older, the cutting of one field at least on the early side is to be commended, particularly on those farms where silage is not made. Early cutting of some of the area saved for hay is of advantage also in bringing about better distribution of the labour, and cutting in rotation also spreads the risk of weather damage.

ALTHOUGH the time of cutting is very important in determining the quality of the crop, the weather after cutting is more important still. Farmers can obtain up-to-the-hour information concerning the weather by sending a collect telegram to "Weather, Wellington," indicating that they require information as to the fitness of the weather for haymaking and the period involved. Although great improvement has taken place in the science of meteorology, the weather cannot yet be forecast three or four days ahead with accuracy. Knowledge concerning the weather on the third or fourth day after cutting, unfortunately, is more important than knowledge about the weather on the day after cutting, for rain falling shortly after cutting is not so harmful as that which falls after the crop is partly or wholly cured.

Quick Drying the Aim

After cutting the aim in haymaking is to get the material dried as quickly as possible, and at the same time maintain the natural colour and aroma of the freshly-cut material. If left exposed to the hot sun for long, the grass will bleach and the clover leaves—the most valuable part of the hay—will become brittle, many falling off and being lost in the handling of the hay. The wind is a better drying agency than the sun, but the farmer must make use of whatever drying agency Nature provides. If it is wind, the grass is fluffed up with tedders or swathe turners to take advantage of every puff of wind that blows; if the sun, the hay is turned to prevent bleaching and to dry both sides of the swathe. In sunny weather, as soon as it is reasonably dry, make windrows to minimise the bleaching preparatory to stacking or baling, but if rain threatens, the material should be put into cocks from the windrows. The drier the material the larger may the cocks be made without risk of undue heating. If rain does fall in the night or for a period to follow, little harm is done to hay in well-built and well-raked cocks. After the rain has gone the wet material should be spread to dry thoroughly before stacking or baling.

Stacking

The site for the stack should be level, well drained, and in a position for easy transport of the material, which is placed on a foundation of straw, or, better still, of logs, permitting of bottom ventilation. Before stacking make certain that the material is sufficiently cured. Even experienced haymakers at times find difficulty in deciding the fitness of the material for stacking or baling. **This commonly occurs when haymaking in hot weather; the hay appears to dry quickly, whereas it is still sappy.** If the hay is too moist before stacking, it will heat, go brown or black in colour, become mouldy, or may even catch on fire. The addition of salt may have an effect in preventing heating of the material or the formation of moulds, and it improves the palatability. Sprinkle it evenly over each layer as stacking proceeds, using about 15 to 20lb. for every ton of hay. If the material is sappy, there is less likelihood of heating if small stacks are made. The small, conical-shaped stack seldom heats unduly or catches on fire.

After the stack is finished it should be well protected from the weather by the provision of a cover of some kind or another.

With greater use being made of the contractor, much more hay is being baled than formerly, when baling was seldom carried out except for transporting the hay long distances. If the contractor does not arrive in time to bale from the windrows, place the hay in large, well-built cocks, with covers properly weighted to prevent damage from rain and strong winds. By baling much labour is saved in feeding in the winter, and no dependence need be placed on the co-operative system.

Co-operative Harvesting

Most of the hay is still harvested on the co-operative system, each farmer and his staff forming part of a gang which may do all the harvesting on several farms. This system has its drawbacks, as all farmers operating

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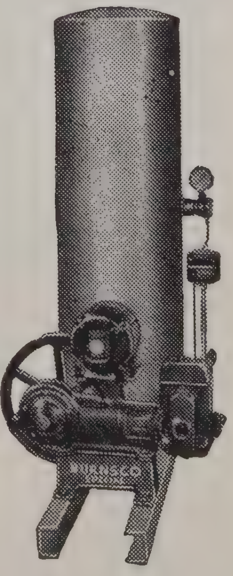

the system know full well. The cutting of the crops necessarily goes in rotation, and many of the crops are cut very late and after the grass has seeded, or harvesting is too hurried and the hay put into the stack in too sappy a condition. The co-operative system does not provide additional labour that is really required to harvest the whole of the area at or close to the optimum time, a period lasting about three weeks.

Frequently farmers harvesting their own hay with their own labour or under the co-operative system are busy harvesting for a much longer period than three weeks, resulting in much of it being harvested at too late a stage for the production of good-quality hay. With the increase in activities of the contractor and assistance from Army labour, more of the hayfields are cut and harvested at earlier stages than has been possible previously.

After the war is over no doubt the contractor with his machinery and labour will come more and more to the fore, and the hay-harvesting period will be shorter than formerly. The farmer will have to beware that his programme is not upset by untimely arrival of the contractor. If the contractor is late, the hay must be cocked, and if too early, the farmer should not permit baling or stacking to proceed until the material is in a fit condition.

Hay is the chief supplementary fodder of the New Zealand dairy farmer, who conserves about 400,000 acres annually. As with other feeding stuffs, quality is most important. Hay cut from early growth of good pasture, well cured, and properly protected in the stack is of high feeding value, and is the foundation of next season's dairy production.

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Harvesting Machinery

NOW is the time for a final look at the cereal harvesting machinery that will be in full use in a few weeks' time. All working parts should be oiled and greased and operated where possible to see that they are functioning properly. Time spent in this way frequently saves many man-hours in the field at a critical period and at a time when replacements are difficult to get and repairs cannot be accomplished on call. Little time need be spent now if the machinery has been overhauled and given proper care during last winter when wet weather has prevented outside work.

Particular attention should be paid to the reaper and binder, which requires special skill for the correction of mechanical troubles and the adjustment of working parts, so that in the hands of a competent operator it will produce tidy sheaves of grain without undue strain on the horses or tractor and the machine. Considerable trouble may be caused in the field if the canvases are not overhauled. Slats which are not properly attached to the canvas should be re-riveted and broken ones replaced. The canvas should be carefully inspected, particularly where the slats are attached, to see that it is in a condition which will stand more work. Spare canvases should be provided where there is any likelihood of replacement, permanent or otherwise, when the machine recommences its work. Canvases should run buckles first, and the slacker they will work without slipping the lighter the draught and the less the wear on their bearings.

The sprocket wheels should be in proper line with each other, and the chains should run hooks first and with the open side of the hooks outwards. The outer or grain wheel should run with a slight lead towards the pole; if it bears towards the grain, it will cause side draught. The cutting mechanism should be examined to see that the knife sections run from the centre of one finger through the next finger to the centre of the next one. Make certain that the knife sections are sharp, and the ledger plates are not worn and are in close contact with the knife sections.

The needle and knotter should be threaded and the action tested by passing through the contents of old sheaves, allowance being made for the lightness of the material. If grass seed is the first crop to be cut, adjustments should be made to the compressor or trip lever spring to produce light sheaves, otherwise the sheaf may sweat and result in discoloured seed of poor germination. The usual causes of untied sheaves are too great tension of the twine, the twine retainer being too loose and failing to hold it while the knotter bills are revolving, the knotter spring being too loose and the bills allowing the twine to slip out of their mouths, or the twine knife being dull. Adjustments can be made to the twine tension, the twine retainer, and the knotter bills, and the knife should be kept sharp with an oil stone. If the machine throws a series of miniature sheaves, look for the trouble in the dog in the binder head—either in the dog spring or through the contact faces of the dog and stop arm becoming worn.

Parts such as chain links, canvas slats, rivets, packer bearings or dog springs, or those which experience with the particular binder indicates need frequent replacement, should be kept in stock, and a watchful eye kept to see that the parts on the binder are replaced before damage arises.

Before operating tractor-drawn binders with power take-off see that the clutch is properly adjusted on the power take-off. Care must be taken to see that it is not so tight that it loses its safety value.

◆

Japanese Millet

JAPANESE millet sown up till early December will provide greenfeed from January onwards, when pastures normally dry up. If the pastures do not dry up, the crop is best utilised as silage. The crop is suited to high temperatures and will withstand very dry conditions. It is grown to a limited extent in the warmer districts in New Zealand for feeding dairy cows.

The millet is permitted to reach about 9in. in height before grazing, which should be rapid and not severe. The crop will provide one or two more grazings in the autumn, but during this period the millet tends to run to seed head and growth is not so rapid. An acre of millet produces much less fodder than an acre of maize or soft turnips. It will, however, withstand dry weather better than maize and does not require hand feding and is not subject to disease.

◆

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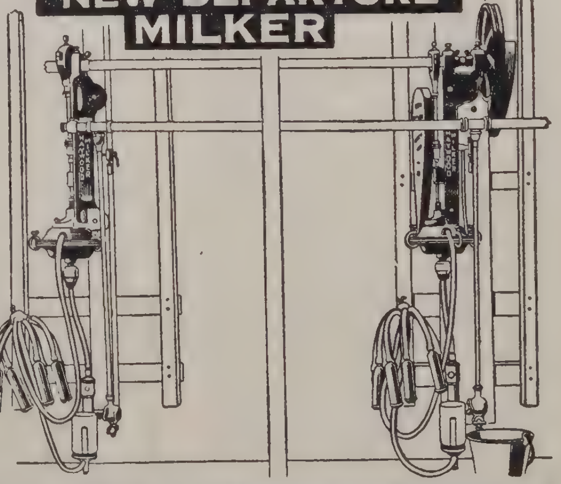

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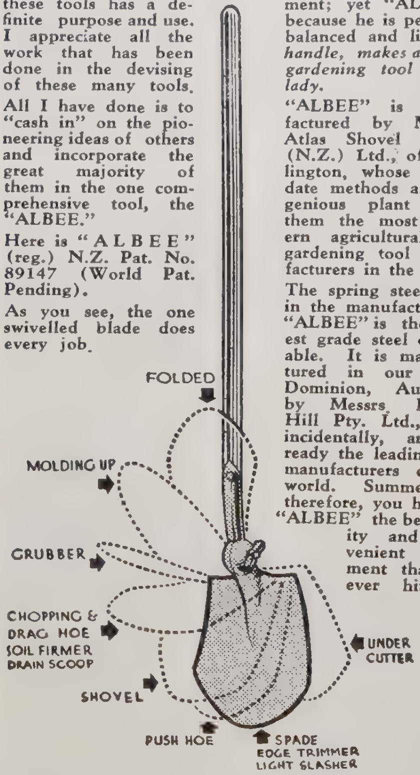
Here is "ALBEE" (reg.) N.Z. Pat. No. 89147 (World Pat. Pending).

As you see, the one swivelled blade does every job.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The adjustable swivel is simply operated and positive *in locking in any desired position.* It is, if anything, the strongest part of a very strong implement; yet "ALBEE," because he is perfectly balanced and light to *handle, makes an ideal gardening tool for a lady.*

"ALBEE" is manufactured by Messrs. Atlas Shovel Works (N.Z.) Ltd., of Wellington, whose up-to-date methods and ingenious plant make them the most modern agricultural and gardening tool manufacturers in the world.

The spring steel used in the manufacture of "ALBEE" is the highest grade steel obtainable. It is manufactured in our sister Dominion, Australia, by Messrs. Broken Hill Pty. Ltd., who, incidentally, are already the leading steel manufacturers of the world. Summed up therefore, you have in "ALBEE" the best utility and convenient implement that has ever hit the market, made by the most modern plant and of the best material. *That* "ALBEE" *is filling a long-felt* want is most obvious from the already phenomenatl sales.

"ALBEE" is really a godsend. Not only is he most useful—no, I will go further—I will say, *indispensible to every gardener and agriculturalist,*—but, also, he solves a problem which has increasingly perturbed us all of recent years—*he makes an ideal, lasting and useful present!* What better birthday or Christmas gift could you give your husband, wife, son or daughter? I can think of nothing better because you will actually participate in the dividends from his work. I am sure, also, that if you gave an "ALBEE" to a friend he would not forget you when he produces abundant vegetable crops!

I can tell you that the "ALBEE" is going to revolutionise the whole of our outlook regarding gardening and agricultural work. *With the coming of "ALBEE" goes most of the drudgery and manual labour.* Whether you believe me or not, nevertheless it is a fact that with "ALBEE" it is not hard work, but good fun, and what was formerly abhorrent now becomes a pleasure. I predict that many who formerly would not have anything to do with gardening will become real addicts. Here are some of "ALBEE'S" accomplishments:—Chop, Drag & Push Hoeing; Posthole Digging & Undercutting; Grubbing; Light Slashing; Digging; Shovelling; Edge Trimming; Drain Cleaning; Muck Lifting; Moulding up Spuds, etc; Soil Pounding; etc., etc.

Finally, he folds up so that you can take him home easily. "ALBEE" used in conjunction with the proved gardening practices advocated in my book "The Awakening," gets results which become a certainty and not a gamble, far quicker and in much greater abundance and *with a remarkable absence of weeds.* Results second to none can be got with darned little effort. That is what I have been looking for and I think the same applies to most of us. I feel, however, that I should warn you that once you get an "ALBEE" you will find that others in your household will insist upon being similarly equipped. Now, I will speak of "The Awakening." A friend of mine brought back from America a copy of "Plowman's Folly," by Ed. Faulkner. This book is the most discussed book in the U.S.A. because of its revolutionary practices. I find that Mr. Faulkner really only confirmed what I had been advocating to N.Z. farmers for many years. I therefore set out to write a small pamphlet based on "Plowman's Folly," but to cut a long story short, one thing led to another and in the finish I ended up in writing a book. Not only does "The Awakening" have in it revolutionary practices for all kinds of farming, but also it has many ideas for gardening which have never before been brought to public notice. You will appreciate when you read "The Awakening" that these ideas, which are backed up by irrefutable illustrations, are only commonsense and most helpful to everybody who cultivates the soil. *Even compost gardeners will realise that although their ideas are correct up to a point, their execution can be improved.* Besides being full of novel information, "The Awakening" has got plenty of "sting" in it. It is interesting, humorous, and instructive. I can promise you it is the best half-dollar's worth you ever got. The price of "ALBEE" is 25/- at Auckland, Wellington, Christchurch, Dunedin, and Invercargill.

For one month only, I make a special introductory offer of *Freight Paid* to your nearest Port or Railway Station for 25/-. However, it must be clearly understood that if he is to be sent to a Flag Station or an unwharfingered wharf, as neither the Railways nor the Shipping Companies will accept responsibility, neither do I. However, an Advice Card will be sent on despatch. In addition, because I believe "ALBEE' to be the best money's worth ever offered and capable of giving you the utmost satisfaction, if you are not completely satisfied, *you may return him to me within 7 days and I will refund you your money in full.*

As orders are being filled in strict rotation you will want to get in early so I attach a convenient coupon.

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Preparation of Lea Land for Wheat

THERE is little doubt that the demand for wheat will prevail in 1946, and farmers will again be asked to grow large areas of wheat in New Zealand. A great deal of the autumn and winter wheat is sown after grass, and to ensure successful crops skim ploughing of lea land should start now.

The work is generally commenced when the horses or tractors are not fully employed in preparing the land for spring-sown crops. Before undertaking the work the pasture should be hard grazed. The whole aim of surface working is the breaking up of the hard surface crust and the killing and decay of grasses, clovers, and weeds before deep ploughing commences. It is better to commence skim ploughing now, when the ground is reasonably soft, than to delay till the summer, when the ground is hard, making penetration more difficult. If the work is delayed until the summer and if the ground becomes too hard for skimming, the hustler can be used from time to time to tear up the turf. Even then, however, spells of wet weather which prevent continuation of the harvest may moisten the ground and the opportunity should be taken for continuation of the skim ploughing.

Before deep ploughing in the autumn the skimmed turf should be thoroughly disintegrated with discs. As a rule the earlier the land is surface worked the earlier deep ploughing can be carried out in the autumn; the turf is given time to rot and become suitable as plant food, while the pulverised turf falling to the bottom of the furrow eliminates large air spaces and makes for a firm seed-bed properly worked throughout.

Swedes

FROM now till January is the period commonly chosen for sowing the swede crop, except in southern districts of the South Island, where sowing may be earlier. The crop is very subject to attack from the beetle of the grass grub commonly known as the "turnip fly." This pest will destroy a whole crop overnight in the two-leaf stage, or will render such destruction that the crop may require resowing. In districts where attack from "fly" is frequently experienced the sowing of the crop is delayed till Christmas or later. Before sowing the ground requires to be well worked, firm and fine. On heavy soils the right condition is achieved by repeated harrowing in the later stages of cultivation, but with light soils rolling before sowing is necessary to secure a good strike.

A very large acreage of the swede crop is still sown with special turnip mixtures, which, while generally giving satisfactory results, are costly. Some mixtures affect the germination, and it is safer to use basic super or serpentine superphosphate. Properly-reverted super will not harm the germination and results in satisfactory yields on most soils. In the moist, cool climates growing the crop on ridges is commonly practised and results in high yields. In other districts drilling in 14in. rows is the method adopted.

At the outset of the war it was realised that swede seed would be difficult to purchase, and steps were taken in New Zealand to grow our own needs, and those seeds grown under the Government certification scheme have come at least up to standard of seed which was imported prior to the war. The varieties under certification are sufficient to meet all requirements. For ordinary purposes the farmer has the choice of Superlative, Grandmaster, and Crimson King; to stand dry conditions there is Sensation, a deep-rooted variety, and to withstand club root and dry rot there is the Resistant variety.

The swede crop is capable of very high yields and does not demand any attention after sowing, except in those areas where it is grown on ridges. It can be used for the wintering of all classes of animals and keeps moderately well. Unfortunately, it is subject to disease and insect attack. With the introduction of parasite control of white butterfly and latterly of diamond-backed moth, however, the difficulty experienced in growing the crop in the milder climates should lessen considerably and it may regain its former eminence in those districts. Today it is still the mainstay of the farmer in the cool, moist southern districts of the South Island.

—J. E. BELL, Acting Land Utilisation Officer, Wellington.

Gestation Table

Mares ..	340	days	from	date	of	service
Cows ..	283	"	"	"	"	"
Ewes ..	150	"	"	"	"	"
Sows ..	116	"	"	"	"	"
Bitches .	63	"	"	"	"	"
Rabbits	28-30	"	"	"	"	"

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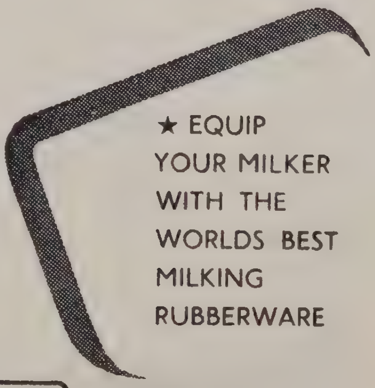

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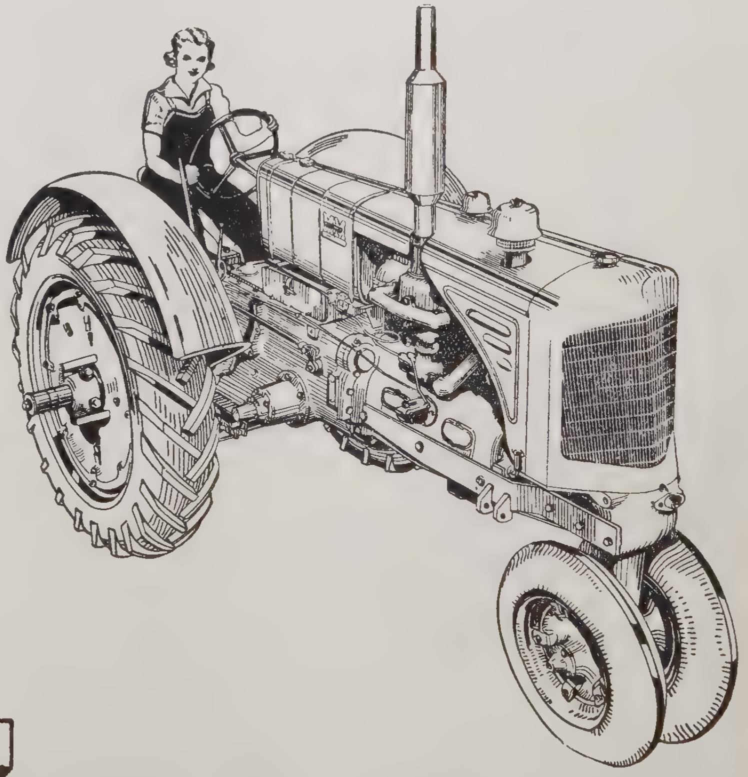

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In the Orchard and Vineyard

Orchard Notes

Harvest Preparation—Insect Control

ALTHOUGH a general idea of the size of the crop can usually be obtained from observations during spraying, it is advantageous for the grower to have a fairly accurate estimate of the quantities of each variety and kind he expects to handle during the forthcoming season, as it enables him to make early arrangements for engaging casual labour and is also of great benefit when ordering materials to be used in preparing the crop for market.

During the present period of uncertainty very few merchants carry large stocks, and orders placed by the purchaser at the last minute are just as unsatisfactory to all parties as ordering in excess of requirements and carrying over a surplus to the following year.

While systematic fruit thinning is being carried out a fairly accurate estimate of the crop can be made.

Thinning Apples and Pears

Thinning should be one of the most important phases of orchard work during the coming two months. A start should be made on thinning the apple and pear crop as soon as the "natural drop" has finished, which is usually about early December, but this varies according to the varieties grown and in different localities.

Commencing with the earliest to be harvested, varieties should be taken in their order. It is frequently difficult to obtain reasonable size in some of the earlier varieties, especially if dry weather conditions prevail. In heavy crops two thinnings are an advantage, and should be carried out if labour is available. The first thinning should concentrate more on breaking up the bunches to allow satisfactory penetration of sprays and also to space the fruit and relieve over-burdened laterals and branches. The second thinning about a month later should remove obviously under-grade fruit, and thus relieve the labour of sorting out rejects when the fruit is passing over the grader.

Spraying

The application of fungicides and insecticides must be continued regularly. If the incidence of disease and local conditions permit, spraying may be modified for varieties which are most susceptible to russeting and are intolerant of lime sulphur after the petal fall stage, such as Cox's Orange, Dunn's Favourite, Kidd's Orange Red, and Jonathan, by the use of colloidal sulphur at the rate of 2 lb. to 4 lb. per 100 gallons of water when the sulphur-content is 50 per cent.

The appearance of red mite on fruit trees is indicated by the bronze-coloured appearance of the foliage. The mites are classified under the heading of "sap-sucking" insects, and over-winter in the egg stage in the crevices and crotches of the tree. On hatching out they feed by sucking the sap from the leaves, causing the foliage to assume a distinct bronze colour. Where a severe infection of mites is in evidence, the fruits also are dulled and detrimentally affected from a grading viewpoint.

The recommended control for this pest is to apply two sprayings of summer oil at a concentration of 1 gallon to 100 gallons water. The first application should be made about mid-January, or earlier if the infection of red mite warrants it, and the second application about 10 days later.

A lapse of 10 to 12 days should be allowed between the last sulphur or lime-sulphur application before the oil is applied. This period should be extended up to four weeks if the foliage is in poor condition.

The summer oil acts as a contact spray and causes the death of the mite by blocking the breathing tubes. Thorough application and coverage is therefore essential for efficient control.

Preparation for Harvesting

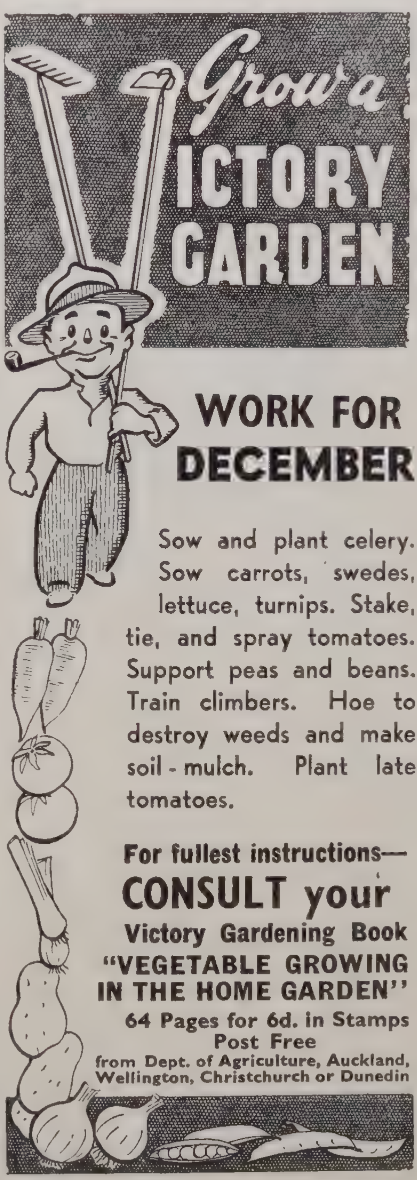
Growers of early peaches and plums will soon be making preparations for harvesting, and the condition of picking bags, ladders, and other equipment should be checked. Cases and trays could be made up, and a supply of suitable liners or wood-wool ordered for early delivery if this has not been done or the supplies are not already on hand.

Cultivation

Light cultivation to break up any surface crust and to conserve the moisture should not be neglected. Some soils have a tendency to pack down very easily after rain and form a hard surface. Frequent cultivation to keep the surface open and free is necessary.

Codling Moth Control

In districts where heavy infections of codling moth are experienced, supplementary measures to the regular arsenate of lead sprays are used, such



WORK FOR DECEMBER

Sow and plant celery. Sow carrots, swedes, lettuce, turnips. Stake, tie, and spray tomatoes. Support peas and beans. Train climbers. Hoe to destroy weeds and make soil-mulch. Plant late tomatoes.

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as the banding of the trees to catch the larvae from the first brood. It is essential that bands, if not chemically treated, be taken off the trees and fresh bands applied before the larvae can complete its life cycle and emerge again as moths.

The first brood of codling moth usually emerges about the beginning of November, or earlier in some districts if conditions are suitable. This emergence usually covers a period of several weeks, and the moth is active for about three to four weeks, during which time an average of 40 eggs is laid by each female. The eggs have an incubation period of up to 14 days before the larvae hatch out and commence to feed. When full grown, the grub usually seeks a harbouring place under the rough bark or in crevices of the tree in which to spin a cocoon and follow through the stage of pupation until finally emerging as a moth in the completion of its life cycle. It is at this stage that the inspection and changing of tree bands is important, as the larvae from the first brood must be destroyed; otherwise the bands defeat the objective and become a breeding ground for the pest it is aimed to destroy. Old bands containing larvae should be destroyed by burning.

Grafting

Trees which have been reworked this year should receive attention periodically to see that vigorous growth from the stock is not overcrowding the scion and to ensure that all wounds are sealed satisfactorily. Scions failing to make reasonable headway the first season are not uncommon; better progress is made as soon as the cambium layers make a satisfactory union.

R. E. BINFIELD, Orchard Instructor, Hastings.

Citrus Notes

Harvesting

MONTHLY pickings of lemons should be maintained throughout the year. This practice prevents the fruit from growing larger than the "preferred" size, and also assists in conserving tree vigour. All lemons that have become yellow or partially yellow, regardless of size, should be picked. Partially-coloured lemons will generally increase in size if allowed to remain on the trees, but this increase is extremely small, especially during the summer. To maintain this fruit in a fresh condition much of the nutrient sap of the tree is utilised which would otherwise be used by the tree to increase the size of the immature fruits. The percentage of fruits maturing smaller than the "preferred" size is therefore not likely to be affected by delaying the picking of the partially-coloured small fruits. The setting of young fruits and general tree vigour are also likely to be adversely affected by leaving the fruit too long before harvesting.

The harvesting of late varieties of sweet oranges and New Zealand grapefruit should now be completed, except for a small number of fruits in the shaded parts of the trees. A heavy setting of young fruits cannot be expected on trees that are allowed to carry a mature crop late into the growing season.

Soil Moisture

During November, December, and January abundant soil moisture is required by citrus trees. Inadequate soil moisture for only a short period during these three months is likely to cause a serious dropping of the young fruit. In cultivated orchards weed growth should be kept at a minimum by shallow cultivation; deep tillage at this period will do more harm than good by injuring the fibrous roots. In pasture orchards mowings should be made at frequent intervals to prevent excessive transpiration by the pasture, especially during relatively dry periods, and the mown grass used as a mulch around the trees. Mulching is of immense value in conserving soil moisture.

Verrucosis

One or more applications of Bordeaux mixture, 3—4—50, should have been made in October and November for the control of verrucosis; this applies to all citrus other than oranges. Lemon orchards which developed appreciable infection during the past season should be given a further application in December.

Scale Insects

The presence of olive (or black) scale on citrus trees is generally indicated by the conspicuous sooty-mould fungus developing on the foliage and fruit. Where the infestation is light a satisfactory control of this pest can be secured by adding 1 per cent. or 1½ per cent. of a certified brand of summer spraying oil to one or more of the Bordeaux sprays applied for the control of verrucosis. Hemispherical (or brown) scale can be similarly controlled. Should there be considerable infestation of these scale insects, a separate oil spray should be applied at a strength of 2 per cent. In orchards where red scale is also present the strength should be increased to 3 per cent., but if red scale only is troublesome, better control will be secured by making the application in February.

Care of Compost Heaps

Large compost heaps in the process of maturing will require constant supervision if the best results are to be secured. The maintenance of a suitable moisture content is of paramount importance, and this should be kept at approximately 80 per cent. of saturation. There are various methods of ascertaining the moisture content of compost heaps, the method suggested being the insertion of a smooth wooden pole, such as a broom handle, into the centre of the heap, where it is allowed to remain for a few seconds. If, on being withdrawn, there is a light film of fine particles adhering to the pole, the moisture percentage of the heap can be considered satisfactory; if a wet slimy film is visible, the heap will be excessively wet. Should the pole appear relatively free from deposit, it can be accepted that more moisture is required.

During the summer months heaps should be tested for moisture weekly. In most cases it is advisable to conserve the moisture as much as possible. This is best done by shading with some material that is readily penetrated by rain, such as brush trimmings from shelter hedges, crumpled straw, or hay.

The method suggested for adding water to the compost is to firstly make holes 3ft. apart on the square over the top of the heap by the use of a crow-bar. The holes should vary in depth, being shallow, medium, and deep in rotation, and approximately the same amount of water should be added to each hole. Heaps that have been allowed to become extremely dry should be completely turned, the inside being placed on the outside. The new heap should be built in layers about 1ft. thick, and each layer thoroughly watered. Heaps that tend to remain excessively wet are best protected from the rain by some suitable material. It is an advantage for this covering to be supported a few inches above the heap to afford ventilation.

—P. EVERETT, Orchard Instructor, Kaikohe.

Bulletin No. 193. Ropes, Useful Knots and Splices, is available free from the Department of Agriculture.

Guide for the Home Garden

Green Vegetables for Autumn and Winter

HOWEVER urgent the work may be at present in the vegetable garden, and there can be no denying such urgency, neglect to provide supplies for late autumn and winter use may have unpleasant consequences so far as family requirements are concerned. Demand for vegetables during the coming winter will certainly not be less than it has been for the last few years, and the chances are that more than ever may be necessary.

December is the month when, in many parts of the Dominion, the early potato crop will be dug and cleared from a part of the garden which, owing to the cultivation it will have received while the potato crop was growing, will be eminently suitable for planting out autumn and winter maturing brassicas—savoy cabbage and broccoli, as well as silver beet.

Where lettuce, spinach, and early beetroot have been grown, carrot, parsnip, and swede seed may be sown, or leek seedlings set out.

Weather conditions during December are not usually conducive to highest seed germination, and this makes necessary greater care in the preparation of the seed-bed. Close attention is also essential during the period of germination. If exposed to brilliant sunshine or hot winds for only a short period, germinating seedlings may be completely destroyed. Hence the need for protection during this critical period.

Care With Seedlings

If the seed has been sown in a box, the seedlings can be removed to a sheltered and shaded position. If the seed-bed is in the open garden, an effort should be made to afford protection to the young plants to prevent the results which may be expected from sun and wind.

Liberal quantities of water should be applied to the young seedlings; but good drainage conditions must also be provided. Where more seed has been sown than was necessary, and the seedlings appear to be crowded, there should not be any hesitation in thinning out the bed. The young plants which are removed can be transplanted and used later.

Seedlings which it is intended to transplant into the garden will be greatly benefited by weekly applications of liquid manure, which should be only half the strength of that usually applied to adult plants.

When the seedlings are being transferred to where they are to grow to maturity the ground should be properly prepared and well manured. Young cabbage and broccoli plants will establish themselves much more readily if "puddled" in and, especially during the early stages of growth, kept well watered. Weekly applications of liquid manure—after watering—should form a part of routine work. The plants will respond well to this treatment.

Summer Pest Control

One of the principal pests which attack plants of the cabbage family during the summer months is aphides.

Don'ts

DON'T leave potatoes out in the garden after they are dug. This is an invitation for the potato tuber-moth to take possession of the crop.

DON'T expect the best results from seeds if the seed-bed has not been properly prepared before sowing.

DON'T neglect spraying tomato plants with Bordeaux mixture. Remember, its application protects the plant; it does not remedy the disease.

DON'T turn the garden over in your mind. This operation requires the use of a spade.

If it is possible to save some of the soap-suds from the weekly wash, these may be applied with almost any kind of spraying apparatus. A bucket pump, if available, is excellent, as the whole plant can be properly covered with the liquid. The efficiency of the spray will be increased by the addition of nicotine sulphate, 1oz. to 4 gals. When the latter mixture is used it is best applied during the hottest part of the day.

To combat the depredations of caterpillars of the white butterfly and diamond-backed moth arsenate of lead should be used at a strength of 1¼oz. to 4 gals. of water.

Carrots

Mid-December in northern districts and earlier in the month in the southern part of the North Island are the most appropriate times to sow carrot seed, in order to avoid disastrous attacks on the roots by the carrot rust-fly. In choosing the site of the seed-bed it is important that it should be as far removed as practicable from where carrots were recently grown, or where the remains of a spring crop have not yet been harvested. Close proximity to any area where celery, parsnips, or parsley may be growing is also undesirable, as the carrot rust-fly also attacks these crops.

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Thick sowing should be avoided, and to determine the quantity of seed which may be used it is advisable to make a germination test. This may be carried out by placing a known number of seeds between the folds of a piece of flannel, which should be maintained in a moist—not wet—condition, and at a comfortable temperature. According to the virility of the seed, it should begin to sprout in from 7 to 10 days. Where the germination is high the seed should be sown sparingly. This is very important in order, if possible, to avoid thinning, except what few young roots may be removed for immediate domestic requirements. Thinning the carrot crop is considered to afford favourable conditions for the entry of the rust-fly to the roots.

Where cultivating operations are entirely carried out by hand rows need not be spaced more than 12in. apart, and in good garden soil 9in. will give good results. For this sowing the varieties Champion Scarlet Horn and Chantenay—preferably Red-Cored Chantenay—are recommended.

Tomatoes

Where dwarf varieties of tomatoes are being grown it is necessary to keep the plants entirely free of weeds. This will ensure proper circulation of air, which, during periods of high humidity, will assist in preventing the development of late blight among the crop. These varieties, from their natural habit of growth, are generally more susceptible to blight attack than the staked varieties. Dwarf tomato plants should be permitted to grow without any pruning whatever. All the foliage which may be produced is necessary to protect the fruit from sun-scald. If planted late, the new Australian-produced dwarf variety Tatura Dwarf Globe, which is planted for a main crop, should be "stopped"—the top growth removed from the main leaders—early, so that the whole of the tomatoes the plants are bearing may have the opportunity of becoming ripe. When this is done additional fertiliser which contains more nitrogen than usual should be applied.

Towards the end of December the best-grown staked varieties should be well on the way towards the second tie. When tying is being done it must not be forgotten that the tying material should first be fastened to the stake and, when passed round the plant, should be taken under the junction of a leaf and the main stem. This method of fastening gives added support to the plant while bearing its crop. Keep all surplus growth cut back. If and when bottom leaves are being removed—those under the first truss—particular care should be taken to cut them close to the stem of the plant, and only with a sharp knife. Instances have recently come under observation where disease has affected plants through neglect of this simple precaution. The fungus responsible for the disease settles on the rough cut or broken portion of leaf stem, and through it enters the main stem of the plant. Encirclement of the main stem ultimately takes place, with the resultant death of the plant.

Commercial growers are finding that disease of various kinds is taking a progressively heavier toll of tomato plants each season, so that, to be successful, the home-gardener must exercise every care to safeguard the plants from which he expects so much. The appearance of late blight should not be taken as a sign that the time for spraying with Bordeaux mixture has arrived. Rather it is an indication that the plants have been neglected, and that spraying, after the infection is discovered, may be too late to save even a portion of the crop. The moral, therefore, is: spray to protect the plants from attacks by injurious fungi.

SEEDS TO SOW DURING DECEMBER.

Beans: Dwarf and climbing.
Beetroot.
Celery: For late crop.
Carrot: For autumn and winter harvesting.
Cabbage: Late savoy for winter.
Lettuce: Sow in open garden and thin out.
Parsnip: For main crop.
Peas: For succession.
Radish: Every 10 to 14 days.
Swedes: For autumn and winter harvesting and storage.
Turnips: For succession.

PLANTS TO SET DURING DECEMBER.

Cabbage (early and late savoy); **cauliflower; broccoli; Brussels sprouts; borecole** (kale); **tomatoes** (last planting).

Asparagus

On 2- and 3-year-old beds of asparagus the cutting of spears should have ended during November. On established beds it is not good practice to continue cutting until the point of growth exhaustion has been reached. The consequences of straining the production of the plant in this way will be reflected in the crop of the following season. However, as soon as cutting for the season has finished the beds should be manured and thoroughly cultivated. Plenty of water should be supplied to the plants while the top growth is developing. In late summer and early autumn a reserve of water must be in the soil to provide for the great amount of transpiration which takes place in the dense foliage during this period. The top growth should not be interfered with until late autumn or early winter. If it can be obtained, a mulch of stable or well-rotted cow manure, applied to the bed after cultivation, will be an advantage during the hot weather of late summer.

Rhubarb

The foregoing remarks concerning asparagus can, in a general way, be applied to rhubarb. Stalks of an ever-bearing variety may be pulled at almost any period of the year, but spring rhubarb—that which is harvested during spring and early summer—will give better results the following season if left unpulled after the middle of December. The crop of rhubarb which is produced after harvesting is finished should be permitted to die down completely before any attempt is made to remove what remains of it. By doing this the vigour of the roots is maintained.

General attention should be given to the crops growing in the garden at the present time. Radish, turnips, and beetroot which may not or cannot be used for food, either in the home or by a neighbour, should be removed and not allowed to draw valuable plant nutrient from the soil. The ground can be turned over at once, and, if seeding or planting to another crop is not of pressing moment, seed of a green manure crop should be sown. Oats, particularly if the area is maintained in a moist condition, will in a short time produce a crop which later can be utilised for the maintenance of soil fertility, which constitutes the basis of all successful crop production.

—D. K. PRITCHARD, Instructor in Vegetable Culture, Wellington.

Temperature

Water boils at 212° Fahrenheit and freezes at 32° Fahrenheit or on the Centigrade scale boiling point is 100° C., and freezing point 0° C. Both the Fahrenheit and Centigrade scales are in common use, though the recording of temperatures in scientific investigations is usually made in degrees Centigrade. The New Zealand meteorological temperature records are, however, recorded on the Fahrenheit scale and every degree F. below 32°F., or freezing point, is reckoned as one degree of frost.

To convert a Fahrenheit reading to a Centigrade reading first subtract 32 then multiply the remainder by $\frac{5}{9}$ while to convert a Centigrade reading to a Fahrenheit reading multiply degrees Centigrade by $\frac{9}{5}$ then add 32.

Seasonal Work for Beekeepers

Good Queens Basis of Success

DURING November colonies should be reaching their maximum strength, and a strict check should be kept on stores. If bad weather is experienced, feeding will have to be continued, unless ample supplies of honey are in the hives.

Where favourable conditions exist and honey is coming in freely add supers to the hives ahead of immediate requirements. Many swarms will be in evidence from now on from neglected apiaries. Any beekeeper who is tempted to hive one of these stray swarms should play safe and treat it before hiving it in its permanent home, i.e., place the swarm in an empty box for four days. At the end of this period destroy any comb that may have been built and place the bees on to full sheets of foundation. This precaution may prevent an infection of foul brood. Keep the grass cut from around the hives.

Queen Rearing

The most important point in successful beekeeping is to ensure that each colony is headed by a good queen. The traits in a queen bee's character are just as hereditary and the degrees between good and bad just as great as in any other kind of stock. A good queen should be prolific, of good size, colour, and shape, and keep her brood nest compact and solid. Her progeny should be good honey gatherers, reluctant swarmers, good tempered, and not prone to robbing. The only way to secure queens with as many of these traits as possible is persistently to breed from stock showing as many of these qualities as possible.

It is best to breed only from pure Italian queens whose correct mating has been assured. The mating can be judged by noting the uniformity of the hatching brood as regards colour and markings. Where the young bees show diversity of colour, some being yellow banded and others quite black, it is a sure indication that the queen has not been purely mated. By persistently breeding from the best strain of bees it is possible to maintain good stocks, while with careless management, or, as is very often the case, no management at all, bees are sure to deteriorate with a corresponding drop in the honey crop harvested.

Methods of queen rearing are legion, the method described herein being specially suited for the commercial beekeeper. It generally takes some time to master the intricate manipulations necessary to successfully carry out the following methods. By closely following a definite plan, however, beekeepers will be agreeably surprised how quickly they can acquire at least partial success.

Doolittle Method

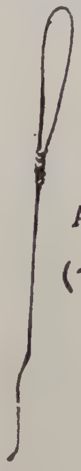
The method most suitable to the commercial beekeeper for the production of the required number of new queens each season is based on a system known as the Doolittle plan. In all queen-rearing operations it must be remembered that to achieve the best results there must be a natural nectar flow, otherwise intensive stimulative feeding is necessary. November, December, and January are generally good months for maximum success in queen rearing.

Equipment Necessary

A transferring needle as shown in sketch A (1) can be made out of a piece of copper wire of about No. 12 gauge. The tip requires to be flattened out and slightly bent over, the objective being to get a thin flat point that will slide under the larva and pick it up without injury. A needle made of wood as shown in A (2) gives very good results, as the very thin lip of wood at the tip of the needle becomes quite pliable when moist and readily slides under the larva. It will be found that this tip has to be constantly renewed. A sharp chisel with the bevel towards the top of the needle makes a better tip than an ordinary pocket knife. Wooden cell cups as shown in B (1) and (2) are used to give protection to the queen cells when handled. If care is taken, it is quite possible to handle the cells without any wooden bases as shown in C. This is done by placing plenty of wax on the bar when securing the cell cups. This gives a good base of wax and is useful in securing the completed cells when pressed into the combs. The cup-forming stick is made from a piece of stick of $\frac{5}{16}$in. diameter, with the tip carefully rounded off and sanded down to a smooth finish as shown at D.

Preparing Cell Cups

Select some good clean beeswax and melt it in a shallow tin placed in a pot of water. The correct temperature of the wax is essential in cup making, and this can be attained by regulating the heat so that the surface of the wax commences to cloud over; then increase the temperature until the surface just remains liquid. The wooden stick should then be dipped into boiling water for half a minute and then into cold water. This prevents the wax sticking to the wooden dipper. With a container of cold water alongside the tin of wax, dip the rounded end of the stick about $\frac{3}{8}$in. into the wax, remove, and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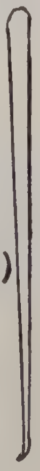
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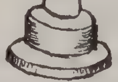
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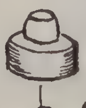
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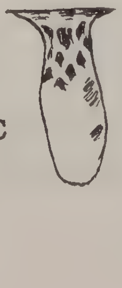
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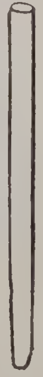
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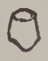
D (2)

place into the cold water. Repeat this process about three or four times until a cup is formed as shown at D (2). Aim to get the most of the wax at the base. After the final dip into cold water the cup is firmly gripped between the fingers and given a twist, when it will come off easily from the wooden stick. A number of these cell cups can be made at one time and stored in a covered jar or tin. In an hour 180 cups can be made up in this way. Some beekeepers may prefer to make a bar of cell-forming sticks, but this requires a special dish to hold the wax, and is justified only when thousands of cups are required. Just prior to commencing grafting the cell cups can be placed in the wooden cups or fixed directly on to bars as shown in sketch E.

Breeding Queen

The breeding queen for this season should be chosen from the colony that shows the maximum qualification, as set out in the beginning of this article. Four days prior to commencing a graft of cells a good clean-drawn-out comb should be placed in the centre of the brood nest of the selected colony, and the bees liberally fed with a thin sugar syrup. This is to secure larvae of the correct age and to ensure that they have been liberally fed.

Cell-Starting Colony

This should be a colony of medium strength, with abundance of young bees, and fed liberally at the same time as the breeding colony. In four days' time the eggs that have been laid in the empty comb by the breeding queen will have hatched out into larvae of the correct age for grafting. Now locate the queen in this cell-starting colony and take her away with all combs containing brood. Some of the bees adhering to the combs may be shaken off so as not to deplete the strength of the colony too much, but be sure the queen is removed with all the brood. The queen and brood can be placed over another colony, with a wire screen between; a small entrance being provided at the side or rear. Now readjust the combs in the cell-building colony so that it is in a single storey with frames of honey and plenty of pollen. Leave space in the centre for the frame containing the bars of grafted cells to be placed at a later stage in the day. This colony will soon get into a great state of excitement with the loss of its queen and all brood.

Grafting

In about an hour's time grafting operations can commence. Have two bars with about 15 to 20 cell cups on each. Some beekeepers place these cups in the cell-building colony as soon as it is made queenless, so that they can be polished up. Others find this is not necessary. Remove the frame of larvae from the breeding colony, carefully brushing off the bees. Do not shake them off, as this will disturb the newly hatched out larvae. Select a sheltered place with a good light and commence quickly transferring the larvae, one into each cell cup. Experience has shown that it is not necessary first to place a small particle of royal jelly in each cup. When transferring endeavour to keep the larvae as near the tip of the needle as possible, as this makes it easier to slide them off into the cups. Fig. F shows a piece of comb with eggs in row 1. Row 2 shows larvae of the correct age for transferring, and 3 and 4 show larvae that are too old. As soon as all the cups have each received a larva place the frame of cups quietly in the centre space left in the cell-building colony. Place a friction top tin feeder over a hole in the mat, and then close the hive. As it takes 15½

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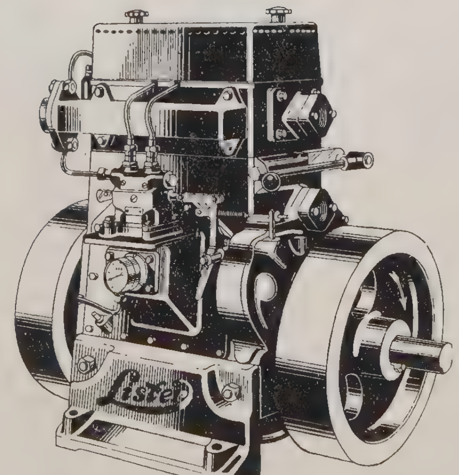

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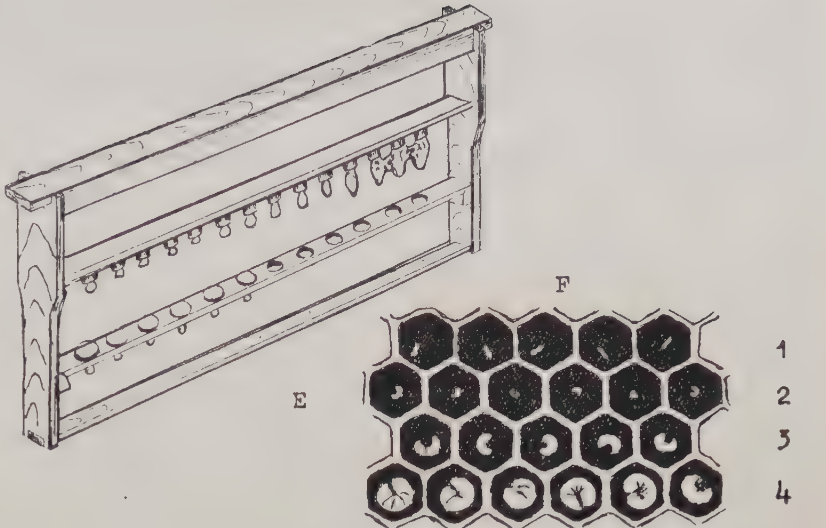
days from the laying of the egg for the young queen to emerge, 10 days after grafting it will be necessary for the beekeeper to make preparations to deal with the finished or ripe queen cells before any hatch out, and a young queen destroys the rest of the batch. A later article will deal with the method of disposing of these ripe queen cells into nuclei.

Instead of leaving the cells to be completed in this colony, some beekeepers prefer to transfer the started cells the next day to what is called a cell-finishing colony. This is a strong two-storeyed hive with the queen down below an excluder, while the top storey contains frames of honey and brood, especially young brood, so as to attract the maximum number of nurse bees to the top super. Into this on the second day after grafting is placed the frame with the two bars of cells. If the manipulations have been successful, there should be from 30 to 35 cells with young larvae being liberally fed to produce queens of good quality.

Alternative to Grafting

To those beekeepers who find difficulty at first in manipulating the grafting needle the following alternative method may be found most satisfactory. Instead of preparing cell cups and grafting the larvae, the cells containing larvae of the correct age are punched out of the combs by means of a sharp tube such as a .303 rifle cartridge with the cap end sawn off, as shown in H. I is a wooden stand with a round upright to push the cut cell out of the tube, as shown in J. This cell is then carefully placed in a wooden base or waxed directly on to the cell bars, and from then on handled in the same manner as the grafted cells.



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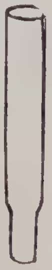

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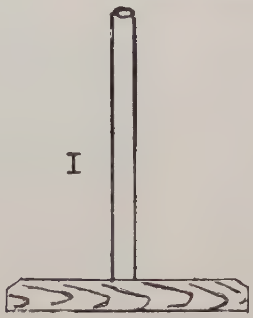

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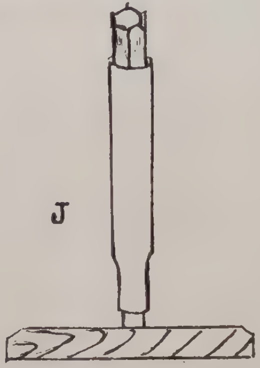

Choose the method that gives you the best results. Considerable experience is required before maximum success can be attained, but once the beekeeper has mastered the technique of queen rearing he can consider he is well on the road to success as a beekeeper.

C. R. PATERSON, Apiary Instructor, Hamilton.

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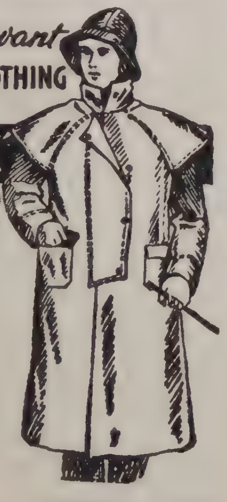
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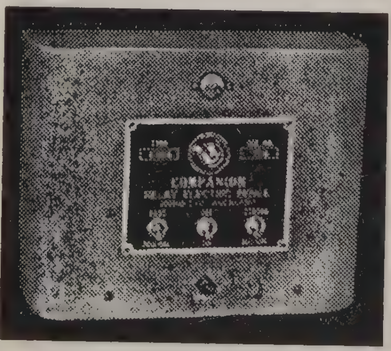
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Notes for the Poultry Farmer

Pullorum Disease and Blood-Testing

ALTHOUGH the number of poultry farmers who have blood-tested their flocks during the present year has been greater than for any previous year, there is still a fairly wide lack of knowledge on this subject. It is particularly desirable that the importance of blood-testing be fully understood in view of the fact that it is one of the obligatory conditions under the New Zealand Poultry Flock Improvement Plan. To understand the position properly it is necessary to review the present knowledge of *pullorum* as it is affecting poultry in New Zealand.

As is generally known, *pullorum* is a disease which can cause serious mortality among chickens between a day old and approximately two weeks of age. It is an established fact that chickens become infected by this disease through the eggs from which they are hatched; in other words, the germs are in the eggs at hatching-time, and have come from the birds laying those eggs. In addition, it must be recognised that uninfected healthy chicks at hatching-time **may easily become infected** by others carrying the disease at a day old. This spread of infection may take place **in the incubator** as well as under the hovers during the early days of rearing. The logical method of controlling and eventually eradicating the disease is therefore to eliminate the hens or pullets which are carrying the germs, and so avoid infected eggs from being hatched.

Spread in Adult Stock

This raises the first point, which is not always understood. Laying birds infected with *pullorum* disease rarely show any outward signs of the disease, and may indeed be excellent layers. There are, for instance, no signs of white scour in these birds, and where birds are suffering from a white scour it is extremely unlikely that this is being caused by *pullorum* disease or bacillary white diarrhoea. A white diarrhoea is caused in the infected chicks, but **not** in the adult laying stock, although they may be heavily infected with the disease. Adult birds thus infected are referred to as "carriers" or "reactors." The second name is used because they react to the blood-test and can, in consequence, be recognised as "carriers" of the disease.

A second point of interest refers to the spread of *pullorum* among adult laying stock. Although not commonly looked upon as a disease of laying birds, *pullorum* can spread among adult stock and in this way gradually infect a flock, quite apart from any outbreak of trouble which may be experienced with chickens during the rearing season. It should also be remembered that chickens which survive an outbreak of *pullorum* during the brooding period invariably become "carriers." A full explanation of the various ways in which the disease can spread has been given in order that poultry farmers will understand why unexpectedly heavy numbers of "reactors" are sometimes found in their flocks.

By

F. C. BOBBY,

Superintendent of the Poultry Industry, Wellington.

Laboratory Test Needed

There is evidence to indicate that *pullorum* disease has been present in New Zealand for some years, but losses among chicks caused by the disease have in many cases been attributed to mismanagement in brooding. Consequently, such chicks have not been sent for a laboratory post-mortem examination and the fact that they died from *pullorum* disease has never been discovered. This raises yet another point which must be stressed. **It is not possible for the layman, poultry farmer, or Poultry Instructor to state after examining a dead chick that it died from *pullorum* disease.** It requires a bacteriological test at a fully-equipped laboratory to diagnose the presence of this disease. It may be added that the test employed is an old-established one, which leaves room for no doubt or expression of opinion as to whether the germ concerned is present or not; the results are clearcut, and full reliance can be placed on the test. It is possible, of course, for the experienced man investigating chick losses, and taking into consideration the evidence before him, to **suspect** an outbreak of *pullorum*, but it is still necessary to obtain confirmation from a laboratory.

More Serious Overseas

Evidence has been collected during the past few years indicating that *pullorum* among poultry in New Zealand is not as virulent as in other poultry-producing countries. For instance, the rate of infection in cabinet incubators is far lower than that experienced in other countries. In the United Kingdom it requires only a limited number of infected chicks in a hatch to cause a serious outbreak of *pullorum* in all the remaining chicks during the early days of rearing. It will therefore be realised just how fortunate New Zealand poultry farmers are in this respect, particularly with the ever-increasing numbers of cabinet machines now coming into use.

There is a further difference between the course of the disease in New Zealand as against that experienced overseas. If, for instance, in England a flock of breeding birds contains, say, 5 per cent. or more "carriers," there is every possiblity of a serious outbreak of *pullorum* among the chicks hatched from their eggs **however efficient the rearing methods employed may be.** On the other hand, in New Zealand chicks from infected hens may show no signs of *pullorum* disease if well managed under good conditions, but contrarily if badly managed or under poor conditions considerable losses from *pullorum* may occur. In other words, the disease may remain latent unless the chicks receive some check in the early stages from, perhaps, chilling, poor feeding, etc. This particular feature of *pullorum* disease in New Zealand has led to many misunderstandings and arguments. It has even been suggested that by encouraging and educating poultry farmers to have good brooding conditions *pullorum* disease would automatically be kept under control and blood-testing be unecessary.

There are, unfortunately, two cogent reasons why this or any similar suggestion cannot be accepted.

(1) *Pullorum* disease is already causing losses among chicks where the brooding conditions and management are efficient.

(2) No one is in a position to state that *pullorum* disease in New Zealand will not increase in virulence if left unchecked in the adult stock.

Cause Should be Removed

While good brooding methods may minimise chick losses from this disease for the time being, it is logical to argue that the root cause of any losses which may occur should be removed. This can be done by systematically blood-testing at least all the breeding stock and, better still, all the adult stock on the farms. To await the time when the disease may have attained the virulence experienced overseas is both a short-sighted and a dangerous policy. Tackle the problem now, with the means already available, and New Zealand poultry farmers may never experience the real scourge which caused alarming mortalities among chicks in other countries before blood-testing was discovered.

There is one further fallacy which must be exploded. There are still some who think that if their birds are blood-tested once their farms are free from *pullorum* disease. Unfortunately this is not true. At the time of blood-testing there is often a small number of birds which, although mildly infected, do not react to this test. Such birds may later be used as breeders and give chicks which, although infected, rear satisfactorily. These chicks will become reactors in due course at the next season's test. However, if testing is carried out systematically each season under normal circumstances, the number of reactors per season becomes less, until the disease is either eradicated or at least kept under strict control, when chick losses from *pullorum* are most unlikely.

Blood-testing involves considerable labour, both for the poultry farmer and for the authorised person carrying out the test. It is therefore desirable that the testing should be done at a time when it will prove most efficient and when it can be handled most conveniently by the poultry farmer. In the first place, the test should be made when the ovaries of the laying birds are active, and it is also recommended that male birds used for breeding purposes should be included in the test. Even if it is argued that they are unlikely to infect hatching eggs, infected males can spread infection to the females with which they are mated. In practice, experience has shown that male birds do not often react to the blood-test unless a flock is really heavily infected with *pullorum*.

Scope of the Test

The majority of poultry farmers who have accepted the policy of blood-testing their stock annually are confining the test to their breeding stock. In this case it is recommended that the test be made at the time the laying flock is culled and prospective breeders selected for the next breeding season. Normally this is done towards the end of the laying season and before the birds go into a moult. If tested at this time and the number of reactors exceeds 5 per cent., it then allows the poultry farmer to re-test his breeding birds as they come into production after the moult and before the eggs are used for hatching purposes. This is a sound method of obtaining the best protection against *pullorum* trouble, and should be pursued each year. It must be realised that a single test at the culling season is not sufficient protection against an outbreak of *pullorum* in the following spring where the test shows a high percentage of reactors. A double test, as suggested, is really essential.

Where poultry farmers are prepared to seek the maximum protection from *pullorum* disease by testing all adult stock on the farm, it is recommended that pullets be tested just as they are "reddening up." This can often be done satisfactorily, and with the least trouble, when the birds are moved into the laying-houses. Where birds are tested as pullets it is seldom necessary to double-test the same birds as hens. Tested as pullets, they then require one further test before being included as hens in the breeding-pen in the following season.

Blood-testing involves much additional work for Poultry Instructors, most of which comes within a limited period of time. It is necessary that the work be carefully organised if poultry farmers wishing to blood-test their stock are to be assisted. For this reason, all poultry farmers requiring the services of a Poultry Instructor for this class of work are urgently requested to make arrangements with the local Instructor well ahead of the time for blood-testing. Looking ahead in this way will be essential if all are to be assisted satisfactorily.

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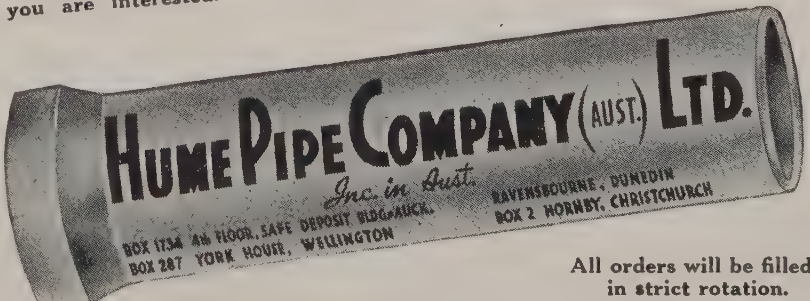
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Federation of Young Farmers' Clubs

How a Young Farmers' Club Was Revived

This article has been contributed by Mr. I. G. Taylor, chairman of the Whakarongo Y.F.C., and is based on a recent talk broadcast by him in the weekly Y.F.C. session from Station 2ZA, Palmerston North.

THE Whakarongo Club was formed in February, 1938, with an initial membership of 12, later increasing to 18 members. Although not very strong numerically, its members made up in keenness and enthusiasm what they lacked in numbers. So far as activities were concerned, the club was among the foremost in the Manawatu district. From the club's inception, a very high standard was achieved and maintained—lectures, "movie" exhibitions, impromptu speeches and debates were included in the monthly meetings, and frequent field days were held. The social side was by no means neglected, such functions as "Parents and Friends Evenings" and dances and socials being held as opportunity arose. The club participated in all district activities—stock judging competitions, debating contests, sports meetings and organised tours, etc.—and played its part, not only in catering for the interests of its own members, but in encouraging, by its example, the Young Farmers' Clubs movement throughout the Manawatu district and the Wellington Council area.

I may perhaps be pardoned for such lengthy praise of the club. While I have no doubt that many similar clubs were carrying on their share of the good work all over the Dominion, it is a fact that we members of the Whakarongo Club were doing a good job, and certainly profiting by it.

Forced into Recess

The successful life of the club continued for over three years. Despite the difficulties created by war conditions, such as shortage of petrol, difficulty in obtaining lecturers, and the gradual depletion of membership, the good work was still carried on. In February, 1942, however, the club was forced to go into temporary recess owing to the fact that of the original membership of 18 no fewer than 14 were either overseas or in camp in New Zealand. This step was taken of necessity, but on the understanding that activities would be resumed at the first possible opportunity.

More than two years elapsed, and then we local young farmers realised that it was "up to us" to move in the direction of reviving the club. Behind this feeling was the knowledge that certain duties lay before us. At this crucial time, with primary production required on an ever-increasing scale, we realised what the revival of our club could achieve. It would mean that lectures, demonstrations and field days would once more be available so that the members of the farming community, both young and old, would have a chance to profit by new discoveries and up-to-date methods at a time when it was necessary for them to make every effort to increase their output.

Interest Overseas

This, in itself, was reason enough why we should attempt to revive our club and assist in the re-establishment of the Y.F.C. organisation throughout the Dominion. We felt, however, that we had a still greater obligation—our duty to our comrades overseas, not just the members of our own club, but members of every club in New Zealand. It was they and their fellows who, eleven years ago, had pioneered the Y.F.C. Movement in New Zealand; their keenness and enthusiasm had built up the movement in the pre-war years, and they had gone overseas to fight for our liberty. We felt that we owed it to them to make an effort to carry on the movement that they so evidently prized. We realised that their interest in the Y.F.C. movement was still maintained.

Letters from members overseas—and not in the case of **our** club alone—all bore testimony to the fact that they wanted the Y.F.C. movement—**their** movement—to be still "going strong" when they returned. Further evidence, if needed, was the formation of a Young Farmers' Club among our lads in Egypt in 1940 with a membership of about 120, the establishment of a chain of 14 clubs in the Pacific with memberships ranging from 40 up to well over the hundred, and five clubs in the Middle East, all with strong memberships. Think of it—our soldier-comrades overseas, those who were interested in farming, realised that the best way to keep up their interest and to add to their knowledge

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while overseas was to form Young Farmers' Clubs. The finest example of this was the club formed in a Prisoner of War Camp in Italy in 1942.

Remembering these fellow members overseas and the interest they still maintain in our movement, our thoughts dwelt on the promise which we, along with other clubs all over the Dominion, had given them. We had undertaken to make every endeavour to keep the Y.F.C. movement in operation until they returned. A number of clubs have been able to carry on. In our own case we had temporarily failed through force of circumstances, but we could make amends if it were humanly possible. Looking round the district we came to the conclusion there were sufficient young men to make it worth while—quite a number had "grown up" and reached the required age during our club's period of inactivity.

Move for Revival

On the advice of the Dominion Organising Secretary, who was then stationed at Palmerston North, a list of names and addresses of all the young men in the district who were eligible for membership was compiled. A notice was then prepared and posted to each of them advising that a meeting would be held on September 11 in the Whakarongo Hall for the purpose of reviving the club. The notice dealt with the past history of the club, and after giving the reasons for its being forced into temporary recess, stressed the value of the club to the district and urged all young men to attend, if possible, so that the club might again function.

The results were gratifying. Nineteen prospective members attended, as well as a few older farmers interested in the club. Members of the Bunnythorpe Club, the nearest neighbour, also came along to give a helping hand. The meeting was addressed by Mr. S. G. Avery, Chairman of the Wellington Council, who spoke on the aims and objects of the Y.F.C., and detailed the decline of the movement during the war period and the present efforts being made to revive it. Mr. S. Freeman, the Dominion Organising Secretary, briefly outlined the history of the Y.F.C. movement since its inception in 1933, and emphasised the need for the Whakarongo Club, along with many others, to resume its activities in readiness for the return of the members from overseas. He particularly urged the encouragement of **young** members in the movement, pointing out that in a few years they would be the senior members of the clubs. He further suggested that had attention been paid earlier to the enrolment and encouragement of younger members, many clubs that had been forced by war conditions to go into recess would have been able to carry on.

Club Work Resumes

A motion, "That the Whakarongo Young Farmers' Club be revived to its former status as an active unit of the Y.F.C. Federation," was then carried unanimously. All young men eligible for membership joined up, numbering 19, which was one more than the club's membership before going into recess.

At this stage, Mr. S. Anderson, Chairman of the Bunnythorpe Club, extended on behalf of his club congratulations to the Whakarongo members in reviving their club. He expressed the wish that, as the two clubs were close neighbours, the spirit of friendly rivalry that had previously existed would be resumed. Members of the Whakarongo Club paid a tribute to the efforts of the Bunnythorpe Club in carrying on under adverse conditions.

The election of officers of the newly revived club was quite a spirited procedure, ballots being necessary in every case, showing the keen interest that members were taking in the reestablishment of the club. Certain necessary business was attended to, including the fixing of a regular night for monthly meetings and the compilation of a list of future speakers. At the conclusion of the meeting hearty votes of thanks were accorded to the Wellington Council Chairman, the Dominion Organising Secretary and the members of the Bunnythorpe Club for their attendance.

Good Attendances

The club's second meeting was held recently, and there was an excellent attendance, including two new members, which brought the total membership up to 21. The meeting was addressed by Mr. J. Linklater, his subject being "How to Conduct a Meeting." Mr. Linklater made a most valuable contribution to the future well-being of the club, and concluded with some interesting facts of Parliamentary procedure.

The attendances at these meetings show that although the club had been in recess for three and a half years, its previous achievements were not entirely forgotten. The younger members of the farming community are still awake to the value of the instruction available through the Y.F.C. movement, and also to the many other advantages of membership.

The revival of this club, along with others which have recently "come back into the fold," has brought the total of active clubs in the Wellington Council area up to 27, leaving, however, a further 56 clubs in recess. Of these, 10 have resumed activities since June of this year.

This is a good effort, but can still be bettered. Come on, young farmers! What the young men of Whakarongo can do, you can do!

◆

Paddock Hot Water

12 Cupfuls Boiled in Six Minutes with the "Thermette" Chip Heater. No special fuel required, only twigs, paper or rubbish. The more wind the quicker it boils. A boon for milkers, stockmen, shepherds, fencers, motorists etc.

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Cooking Grid, 3/6 extra.
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IN TIMES LIKE THESE

Train Travellers Can Help Each Other

In order that the main expresses may be used for urgent and long distance journeys, intending train passengers are urged to travel by the secondary services wherever possible. Should changed plans prevent reservations from being used on due date, arrange cancellation early and enable someone else to travel. Timely cancellation of "reserves" will save you the additional charge payable for non-use without requisite notice.

Seat Reservations Regulate Passenger Travel

South Otago District Field Day

THE first of its kind in the district since the beginning of the war, the field day recently arranged in the Milton district by the South Otago Y.F.C. District Committee proved a great success. About sixty Young Farmers' Clubs members attended, representing the Warepa, Clinton, Clutha Valley, Milton and Moneymore districts.

In the morning the party visited the property of Mr. Wm. Allison, at Moneymore. The horses were inspected, and Mr. Allison and his brothers gave some sound, practical advice on the selection of draught horses. Mr. Allison is well known as a horse breeder, and the knowledge he passed on to the Young Farmers will be of great value. The Chairman of the Clutha Valley Y.F.C., Mr. Coll, expressed thanks on behalf of the visitors.

Members then moved on to Mr. Robt. Clark's sheep yards, where Mr. S. Ottrey, Milton, demonstrated on Romney and Southdown sheep, animals from Mr. Thornthwaite's flocks being at his disposal for the purpose. His demonstration was particularly instructive, the quality points necessary in selecting sheep for breeding purposes being detailed. At the conclusion Mr. A. Hammond (Warepa Y.F.C.) thanked him on behalf of the party.

In the afternoon the party visited the Bruce Woollen Mills, where they were able to see for themselves the whole series of processes in the conversion of the raw wool into the finished fabric. Mr. Firth, the manager of the mills, showed the party round, and his detailed explanations were greatly appreciated. A vote of thanks was accorded to Mr. Firth on behalf of the Young Farmers of the South Otago district by Mr. C. Tweedie (Chairman of the Y.F.C. District Committee).

A highly successful ball was held at night in the St. John's Hall, Milton, music being provided by the Caledonian Dance Band. Mr. C. Tweedie acted capably as M.C., and a number of the visiting members from outlying clubs stayed for the entertainment.

Draught horses on Mr. Wm. Allison's property, Moneymore.

Reports on Club Activities

WESTERN SOUTHLAND.

Dipton.—Election of R. Jukes as secretary, to replace R. Hayward, resigned. Dance to be held, the proceeds to go to soldiers' parcels fund. The chairman, W. King, gave reports on the recent Dominion Executive and annual general meetings of the federation, held at Timaru. Eleven members present out of sixteen.

EASTERN SOUTHLAND.

Five Rivers.—Report on meeting of Otago-Southland Council held at Invercargill. Impromptu debate, "That a Primary-Producing Country is more Enduring than an Industrial Country." Speakers, B. Hamilton, Rex Thomson and A. Muir (affirmative), D. Muir, F. Moore and T. J. Malone (negative). Eleven members present out of twenty-one. At the previous meeting an address was given by Mr. G. A. Hamilton on "How to Conduct a Meeting." Thirteen members and four visitors present.

SOUTH OTAGO.

Clinton.—Officers elected at annual meeting: Advisory president, Mr. James Murney; chairman, J. C. Mitchell; secretary and treasurer, D. L. Morahan; auditor, Mr. D. M. Davidson. Ten members present; total membership fifteen.

NORTH OTAGO.

Enfield.—Two members welcomed home from overseas. Final arrangements for club field day to be held on Mr. D. Kennedy's farm, Windsor. Address by Mr. W. Malcolm, a member of the Meat Board, on "Our Relations with Great Britain in regard to the Meat and Wool Sales in War and Post-War Years." The speaker also gave some interesting facts in the history of the early sheep runs in North Otago. Fourteen members attended out of eighteen.

SOUTH CANTERBURY.

Geraldine.—Club debate, "That Arable Farming is more Beneficial than Grassland Farming to New Zealand's War Effort." The award was given to the negative. At the previous meeting it was decided to hold a dance for patriotic purposes; talk by Mr. L. Blackmore, Department of Agriculture, on "Scientific Farming." Attendances of 28 and 25 respectively out of a total of 34 members.

CHRISTCHURCH.

Ellesmere.—Report on recent dance; profit of £2 9s. 2d. to be used for soldiers' parcels. Two new members elected. Result of football match between the Darfield and Ellesmere Clubs, Ellesmere 14, Darfield 3. Talks given by members recently returned from the Pacific, Ptes. B. K. Wagner and W. L. Hurford, and Gnr. M. E. Brooks. Twenty-three members present out of fifty-five.

NORTH CANTERBURY.

Scargill-Omihi.—Christmas parcels to be sent to members overseas. Talks by Messrs. Healey and McKay on "Nasella Tussock."

MARLBORORUGH.

Seddon.—Debate against the Flaxbourne Club, "That Natural Manures are more Beneficial than Artificial Manures." The teams were:—Seddon, Messrs. Marfell, Smith and Langridge (affirmative); Flaxbourne, Messrs. Jackson, Marion and Forsythe (negative). The Seddon team won the debate by four points. Mr. Lockhart acted as judge, and Mr. Morrin as timekeeper, Mr. W. J. Kennington being in the chair. After the debate an interesting lecture on the "Care of Farm Machinery" was given by Mr. Cuddon. There was an attendance of 24 out of a membership of 26.

NELSON.

Dovedale.—Arrangements for a combined dance with the Junior W.D.F.U. Talks given by Messrs. D. Batt and C. Burnett on "The Use of Ensilage as a Fodder" and "The Treatment of Foot-rot in Sheep" respectively. There were seven members present out of twelve.

WAIRARAPA.

Carterton.—Arrangements for future lectures. J. Rose elected as a district delegate. Interesting "movie" pictures exhibited by Mr. N. Lamont, Department of Agriculture. Fifteen members present.

Masterton.—Teams picked for debate with Carterton Club. Senior, W. D. Buick, E. M. Bannister and E. Hamill; subject, "That the Practical Farmer has contributed more to the Advancement of Agriculture than has the Scientist." Junior, G. Evans, M. Renall, I. Raynor and G. Donald; subject, "That the Dairy Farm requires more Managerial Ability than does the Sheep Farm." Mr. T. Caverhill gave a very spirited and interesting address on "Early Life in the Wairarapa," quoting his own experiences on many of the larger stations in the Wairarapa district. There was an attendance of 32 members out of 64.

MANAWATU.

Apiti.—This club has recently resumed activities, after having been in recess for over two years. The following officers were elected at a meeting of 25 members:—Advisory President, Mr. H. C. McIntyre; chairman, P. R. McKay; secretary and treasurer, F. G. Mapson. This club, which had a strong membership of over fifty members before the war, will have the good wishes of all other clubs.

Oroua Downs.—Discussion re Lincoln College Scholarship. Members to take part in a judging competition in conjunction with the Boys' and Girls' Agricultural Club's judging day at the school. Arrangements for a dance. 2nd Lieut. A. Carmichael, an old member of the club, to be asked to address the next meeting on his impressions overseas. An interesting lecture was given by Mr. A. J. Cederman, Department of Agriculture, on "Tree-planting and Shelterbelts on the Farm, and Home Orchards." An attendance of 16 members out of 31.

Pohangina Valley.—Mr. J. McDonald, accountant, of Ashhurst, to be asked to address the club on "Farm Book-keeping" at the next meeting. Address by Mr. P. W. A. Balmer on "Faults and Blemishes to look for when purchasing a Horse." Ten members present out of 21.

Rongotea.—Resignation of Chairman, W. M. Hunt, accepted with regret; the secretary, F. Wood, was elected to the position for the remainder of the year, R. Hill being appointed to replace him as secretary. Talk by Mr. D.

D. McKenzie, Farm Dairy Instructor, on "The Cleaning and Operating of Milking Machines"; this was followed by a general discussion on variations in cream grades and tests. There were 17 members present out of 19.

WANGANUI.

Bulls.—Final of the second round in the Wanganui District Inter-Club Debating Contest between the Bulls and Marton senior teams. The subject was, "That Straightout Grassland Farming is more economic than Grassland Farming supplemented with Cropping." The Bulls team supported the motion. Teams: Marton, M. F. Gray, K. G. Coles, H. R. Miller; Bulls, I. Jamieson, H. Clark, F. Thorby. Marton gained the decision by a small margin. Mr. Harper, Marton, kindly acted as adjudicator.

Hunterville.—Lincoln College Scholarship discussed. Two members selected to give talks at the next meeting on "Pig Farming" and "Stud Sheep Farming" respectively. An interesting lecture was given by Mr. Geo. McDonald, veterinarian, on "Veterinary Topics Generally." The lecture was keenly appreciated and called forth many questions. Sixteen members attended out of a total of 23.

Marton.—Further arrangements for supper at meetings. Discussion re Lincoln College Scholarship. Progress report on district debating contest. Report by delegate on recent meeting of Services Advisory Committee. Appointment of another delegate, on account of resignation of first. Three more members elected to club committee. An account was read of the work of the Agricultural Section, E.R.S., 2nd N.Z.E.F., C.M.F. Final arrangements for dance. A talk was given by Flt./Lt. T. Martin Willis, Greatford, entitled "Some Experiences in the R.A.F. Ferry Service, Africa." Twenty-two members present out of 34. At a meeting inadvertently not reported previously the following business took place:—Report on catering for field day; arrangements for committee members to canvass for new members; election of representative on local Advisory Rehabilitation Committee; acceptance of donations from Marton Branch of N.Z. Farmers' Union, and also from Mr. W. G. Aitken. Also a lecture by Mr. I. D. Morton, Dairy Research Institute, Massey College, on "Aspects of Dairy Research." The speaker dealt with the D.R.I. and its purpose, and the work at present being carried out on artificial insemination, artificial lactation, feed flavours, etc. Attendance of 19.

Ohakea R.N.Z.A.F.—Recent activities included the following: Talks by Messrs. S. G. Avery (Chairman, Wellington Y.F.C. Council) and S. Freeman (Dominion Organising Secretary) on the Y.F.C. organisation generally. Lectures: Mr. Johnson, Department of Agriculture ("Beekeeping," lecture No. 3), Mr. Eglington ("Care and Feeding of Pigs"), and Mr. G. Douglas ("Animal Nutrition and Stock Feeding"). An invitation to all those taking farming courses on the station, with a view to hearing their problems and giving some assistance, met with a ready acceptance and was responsible for a very successful evening. There are at present 22 members in the club.

TARANAKI.

Pukengahu.—This club has recently been revived after having been in recess for two years. The membership now stands at 19, with prospects of more in the near future. This is particularly good news, as all the clubs throughout Taranaki found it necessary to go into recess, and Pukengahu is the first to resume activities. Good luck, Pukengahu; may your example be copied by the other Taranaki clubs!

SOUTHERN HAWKE'S BAY.

Ballance.—Arrangements for overseas parcels. Lecture by Mr. L. L. Marsden, Pig Supervisor, on "The Rearing and Management of Pigs." There were 17 members present out of 20. At the previous meeting an address was given by Mr. R. G. McKenzie, Ballance, on "How to Conduct a Meeting."

Dannevirke.—General business. Letter of thanks to be sent to Miss Casey, who has done the club's typing for some time past; Miss Casey, who is attached to the office of the Farmers' Union in Dannevirke, is leaving to be married. Three-minute talks were given by the following: B. Davidson ("Permanent Docking-yards"), and J. Lowes "The Use of the Plough"). Address by Mr. J. Whibley on "Rotational Grazing"; the speaker answered many questions, and was accorded a hearty vote of thanks. Thirty members present.

Mangatainoka.—Two new members enrolled. Arrangements for future lecturers. The chairman welcomed the advisory president (recently elected), Mr. Patchett (Farmers' Union) and Mr. G. Cotter (the club's past chairman). Mr. Cotter, who has recently returned from the islands, gave an interesting talk on the Y.F.C. organisation among the troops in the Pacific area; he also dealt with farming methods and life in general in the islands. Sixteen present out of 18.

NORTHERN HAWKE'S BAY.

Wairoa.—Decided to purchase a bond for £5 in the Victory Loan. Final arrangements to be made at next meeting for a fat lamb competition for young farmers in conjunction with the annual A. and P. fat lamb competition for the district; to be made a field day, with Y.F.C. members judging on the hoof and on the hooks. Mr. L. C. Field, Gisborne Veterinary Club, gave an address on the aims and objects of this particular Veterinary Club. Mr. A. D. G. M. Laing, veterinarian, Department of Agriculture, Hastings, also addressed the members on "Artificial Insemination" and "The Bull Fertility Scheme," answering many questions during and after his talk. Both addresses were very keenly received. There were 23 members present at the meeting.

TE KUITI.

Otorohanga.—Arrangements for a field day. Date of birthday dance finalised. Messrs. T. Rogers and C. M. Staite, delegates from the Otorohanga Pig Club, were present, and appealed for new members; they also explained the Crop Subsidy Scheme. An interesting lecture entitled "Early Otorohanga" was given by Mr. F. O. R. Phillips. Attendance of 15 members out of 23.

Paewhenua.—General business. Informal talk by Dr. Alistair MacFarlane on the N.Z. Medical Services; he also showed interesting films taken while he was on active service.

BAY OF PLENTY.

Kati Kati.—General business. Addresses by Messrs. M. Palmer and H. B. Capamagian, on "How to Conduct a Meeting" and "Experiences in the Greece Campaign" respectively. Nineteen members present out of 25. At a previous meeting Mr. C. Hume gave an interesting lecture on "Land Valuation," 13 members being present.

Paengaroa.—Two new members enrolled. It was announced that the club had raised £18 12s. for the Y.F.C. Memorial Fund at its birthday dance. Brief report by the chairman on the recent quarterly meeting of the Western Bay of Plenty District Committee; following this the secretary described the field day held at the local dairy factory. The chairman announced that the club team had won the debating shield for the Bay of Plenty, and the debating cup for the Eastern Area of the Auckland Province. Address by Mr. J. Blamires on "Representative Government." Twenty-three members attended out of a total of 46.

Te Puna.—Arrangements for a club dance. Mr. Gibson gave an interesting demonstration on "Budding and Grafting." Twelve members present out of 24.

Welcome Bay.—This club has recently been formed to cover the districts of Ohauiti, Welcome Bay and Papamoa. Officers elected:—Chairman, J. R. Wright; secretary, A. G. Talbot; treasurer, O. H. Sorrenson; Mr. F. Keam to be asked to act as advisory president. Twelve members enrolled at the initial meeting.

WAIKATO.

Okoroire.—Mr. Patterson, Apiary Instructor, Department of Agriculture, gave an instructive lecture on "The Bee-keeping Industry in New Zealand." Mr. D. S. Ross (immediate past President of the Federation) and Mr. S. Freeman (Dominion Organising Secretary) addressed the meeting on the Y.F.C. movement; both speakers gave some very helpful advice and congratulated the club on its progress. There were 15 members present out of 33. At the previous meeting a lecture on "Banking in Connection with Farming" was given by Mr. E. MacIntyre, manager of the Matamata Branch of the Bank of New Zealand; 24 members were present.

Te Awamutu.—Field day at Ruakura. Members were shown over parts of the farm that they had not previously seen at other field days. Mr. Cameron explained various experiments being carried out; swamp land being stumped was also inspected. After lunch Dr. McMeekan conducted the visitors over the artificial insemination centre, where the bulls in use were inspected; the laboratory was also visited, the whole of the work proving very instructive. There were 24 present, including three farmer friends.

Te Pahu.—This new club was recently formed through the keenness and energy of a local young farmer, Stan Fretwell, who wrote to the Dominion Organising Secretary to find out if a club could be established in the district. As a result of his endeavours a meeting was called and a club formed with an initial membership of 19. The meeting was addressed by Messrs. D. S. Ross (immediate Past President), S. Freeman (Dominion Organising Secretary), F. S. Atcheson (Chairman, Auckland Council), W. H. Benson (Advisory Member, Te Awamutu Y.F.C.), C. Eyre (Chairman, Te Awamutu Y.F.C.), J. E. Turner (Te Awamutu Y.F.C.), and J. M. Murray (Department of Agriculture, Hamilton). A list of the officers elected will be published next month.

AUCKLAND.

East Tamaki.—This club has recently resumed activities after being in recess for over four years. Officers elected:—Advisory president, Mr. H. Ferguson; chairman, W. Landon; secretary, L. W. Gubb; treasurer, E. Guy. The initial meeting was addressed by Mr. F. S. Atcheson (Chairman, Auckland Y.F.C. Council). At a subsequent meeting a social committee was formed, and arrangements were made for a field day to consist of a visit to Booth MacDonald's factories. Twenty-nine members present at this meeting out of 33.

Franklin.—General business. Address by Mr. F. S. Atcheson (Chairman, Auckland Y.F.C. Council) on the present position of the Y.F.C., and the plans for the future. Mr. J. P. Beggs, District Y.F.C. Secretary, also spoke on the Y.F.C. movement, and Mr. Moss gave a talk on "How to Conduct a Meeting." There were 15 present out of 20.

NORTH AUCKLAND.

Kaukapakapa.—Field day to be held on Mr. J. B. Hooper's farm at Glorit. Address by Mr. F. S. Atcheson (Chairman, Auckland Y.F.C. Council) on the Y.F.C. movement. Attendance of 16 members and three visitors; the total club membership at present is 49. At the previous meeting, owing to the chairman having left the district, his resignation was regretfully accepted; G. McLean was elected chairman in his place. Lecture by Mr. P. S. Syme, Department of Agriculture, on "Pasture as an Indication of Soil Fertility." Seventeen members and four visitors present.

Whirinaki.—This club was formed some months ago among the Maori youth in the district. Recent activities include the following: Two demonstrations by Mr. McIndoe, Department of Agriculture, on "The Pruning and Grafting of Fruit Trees," and a visit to the Hokianga Co-operative Dairy Co.'s factory, where the members were shown round by Mr. Halligan, the manager. The different departments were visited, and all details explained, members being made conversant with the process of butter-making right to the packing-room where it is finally prepared for shipment. The secretary, Geo. Wynyard, reports that this field day made a very deep impression on the club members, who now fully realise the necessity for the increased production of butter for overseas and the meaning of "cleanliness" and the "care of the cream" from farm to factory. To use the secretary's own words, "Seeing is believing —and when a Maori sees, he believes!" The club is doing some very good work, and it is understood that the membership is increasing.

Women's Land Service

Horticulture as a Career

WOMEN are already thinking ahead to the days after the war when they will be looking for new jobs and professions. Horticulture may be one of the things in which women will take a keen interest later on.

Now, when more and more tasks are waiting for women, and when new professions are opening their gates to them, horticulture is a field in which women have not been particularly active so far.

In Britain horticulture, which in every-day English means just plain gardening, is not merely a wartime occupation for women or a hobby. For more than 50 years Swanley and Studley, the two big horticultural colleges—and many others besides—have turned out more than 100 women graduates annually—women who spent three to four years studying all aspects of fruit, flower, and vegetable culture and hothouse work. These women have proved to be man's equal in plain, practical gardening. Ploughing and tractor driving and felling trees are among their duties—and they like it.

But is there a career for women in this line? Well, let us look at the ambitions and achievements of those who have studied the profession. First, there are the decorative arts—floristry and landscape gardening, in which women are sometimes even given preference over men. No need to say more about that, because girls in this type of work are nothing unusual. Neither are female research workers in the agricultural laboratories and research stations, nor a woman librarian or editor of a gardening paper.

In Britain, especially during the war, when early crops from France, Belgium, and Holland cannot be obtained, greenhouses, hotbeds, and cold frames are crammed, as well as hundreds of glass cloches (little tents or roof-shaped contraptions which protect tender plants and which can be moved to where they are most needed).

Recently in America women have been training more extensively in horticultural and farm work, at colleges and in special training schools. There are now far more opportunities open to them than formerly, and steady employment is more certain than ever before.

Women interested in the profession must, however, choose the branch most suited to them as individuals. Farm workers have far different duties to perform than laboratory technicians or garden consultants. For the woman who considers the profession seriously horticulture and farming may well prove to be as important a career after the war as now.

British Land Girls assisting in Devon drainage scheme to bring 4,000 more acres into production.

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Women Driver-Mechanics for Huge Excavators

THE driving and maintenance of huge excavators is an unusual job for girls, but one which has been undertaken with great success in Britain.

When labour call-ups made it impossible for one large firm of excavator manufacturers to maintain their staff of demonstrators they established a training school for men and women drivers, in conjunction with the Ministry of Agriculture and Fisheries and the local War Agricultural Executive Committee. Some of the trainees are employed as the firm's demonstrators, who deliver the tractors to buyers and remain for one week to teach the driver how to operate the machine efficiently. Others are employed by War Agricultural Executive Committees in various counties.

To the school every fortnight come a squad of women who, together with men, are taught to drive and maintain the tractors. These women have had little or no experience of mechanical plant; among the previous occupations of those who have passed through this school are dressmaker, shop assistant, typist, hairdresser, bank clerk, cinema usher, and photographer. Now they are driving tractors weighing nearly nine tons and excavating hundreds of tons of earth a day in the making of ditches to drain unproductive land.

In addition to being taught to drive, all trainees are shown how to make adjustments and maintain the machine in good order. They are also taught to recognise the different units of the machine so that in the event of a breakdown the necessary spare part can be ordered from the stores department of the firm.

Some 280 women have so far passed through this school and have been sent out as drivers on excavators in 27 English counties.

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CORRESPONDENCE SCHOOL COURSES

OPEN TO LAND GIRLS.

LAND SERVICE members are advised that the same privileges are available to them as to members of the Armed Forces with respect to courses taken through the Correspondence School of the Education Department. A deposit of 10/- is required before text books are issued to pupils, but this amount is refunded when the books are returned at the end of the course.

The Correspondence School Branch has full examination courses in academic subjects, and practical courses in needlework and allied subjects, drawing, arts and crafts, also a full course in agriculture and farming. There are short or long courses.

Write direct to the Headmaster, Correspondence School, Clifton Terrace, Wellington, and mark envelope Land Service member.

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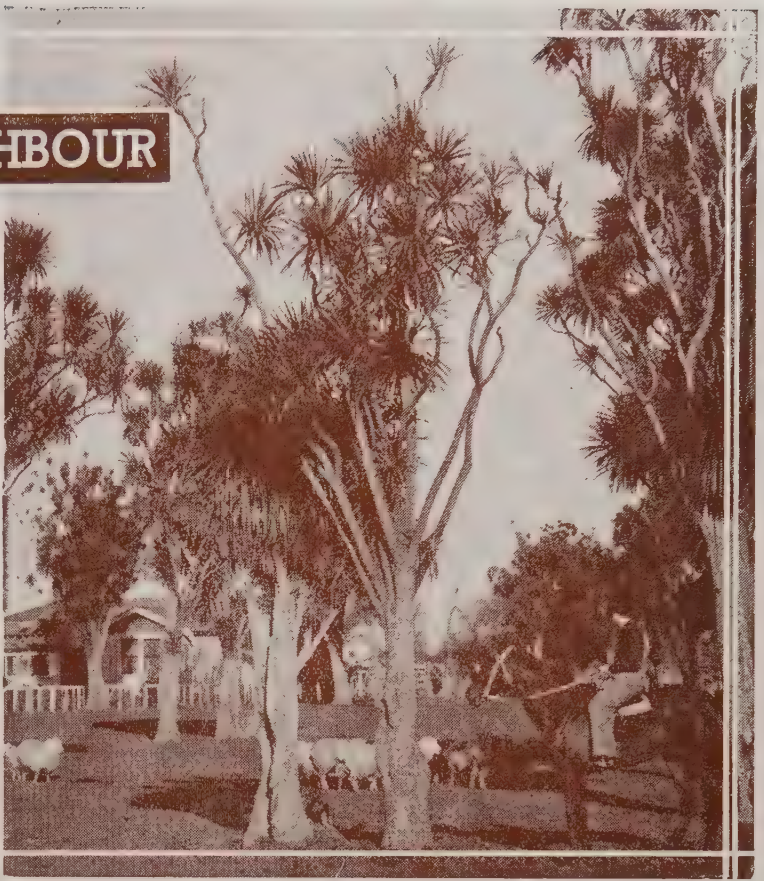
Health and Fitness

MANY people are apt to regard the achieving of physical fitness as a mere mechanical process of regular exercises. It is certainly true that the "daily dozen" does go a long way towards putting our bodies into sound trim, but, at the same time, experts are pointing out that indifference to the kind of food we eat can prove a real stumbling block in the way of national fitness. Study your diet now and always.

THE GOOD NEIGHBOUR

Letters



MY mail has just arrived; it is an exceptionally large one, and my desk is almost buried under the snowy avalanche of letters, the postmarks ranging from Whangarei in the north right down to a tiny township at the end of the southernmost province. I know the handwriting on many of the envelopes, but quite a number are addressed in scripts which I have not seen before, indicating further additions to my already extensive list of correspondents. (And speaking of handwriting, it varies as much as personality.) I have to read every style of calligraphy from immaculate copperplate to the veriest scrawl, and I am becoming something of an expert in deciphering what Dorothy Sayers calls "the hieroglyphic, the cryptic, and the triumphantly illegible," though I admit I am not infallible when it comes to Maori place-names! My paper-knife will work overtime as I settle down to enjoy the budgets of news and views from old friends, while I am ever ready to welcome the new.

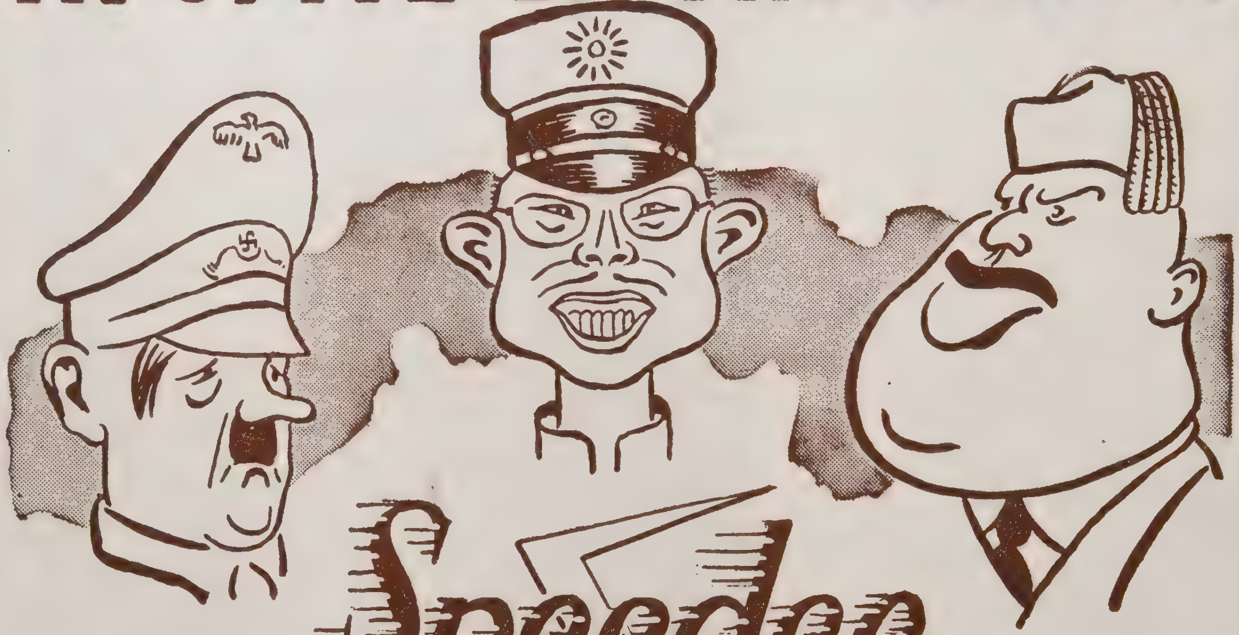
Now the collecting of used stamps to sell in aid of Red Cross funds has become one of their regular activities, my own popularity with my niece and nephew has been greatly enhanced. Thanks to their gleanings from my w.p.b. their records as collectors have been unequalled by their school companions, much to their delight. Another good thing arising from this continual flow of correspondence is the improvement it has effected in my general knowledge of New Zealand geography. Needless to say, a set of road maps occupies a foremost position among the works of reference on my bookshelves, and I am now as familiar with the names of remote backblocks districts as I previously was with those of the principal towns. Indeed, these small localities have an entity all their own to me, thanks to the "Good Neighbours" resident there. Now P— is not merely an isolated spot on the East Coast with a largely Native population, but it is the home of "Dorothy," whose ability with recipe book and rolling pin would make her fortune if she were in the catering trade. Similarly with K—, off-shoot of a once flourishing gold-mining centre reached via the winding gradients of a mountain road: here Mrs. "S" copes valiantly with the task of bringing up a young family while her husband does his bit as a soldier.

Some time ago a regular contributor wrote: "I often notice new names in our 'At Home' pages. How ever do you manage to know us all individually, or have you given it up as a bad job?" Many of you would probably be surprised to learn just how well I DO know you—not your physical characteristics, perhaps, such as height and weight and colouring, but the much more important essentials: your likes and dislikes, your joys and troubles, your hopes and dreams—all the intimate, intangible things that constitute the real "you." For instance, Mrs. "A's" amusing anecdotes apropos her menage are so vivid that I feel personally acquainted with each member of her household, even to the new baby! The "Bee's" are also family people and though they are only recent recruits to agriculture, they have the capacity to work hard and make the best of life, always finding time at the close of the busiest day to spend a little while with their books and music. "Darky Top" occupies her leisure moments with handcrafts; "Emma's" indefatigable pen has brought her many friends in distant countries; "Effie" shares my fondness for music and "Jonathan" is a mine of information concerning Scandinavian folklore. Then there is "Tinkle Tinkle," with her love of beauty and her magical gift of verse-making; "Peggy," whose frustrated girlhood ambitions, far from embittering her, have endowed her with sympathy and insight in the helping of "lame dogs over stiles"; and "Haruru," who, having exchanged the classroom for a cowfarm, now finds her knowledge of psychology useful in the training of her little fellows. "Biddi-Jan" and "M" possess "green fingers," and "Tiggetty Boo" and "Roundabout" always share with me the choicest quotations from their current reading. I could extend the list indefinitely, for the merit of letters is "to carry the living writer into the reader's presence, such as he really is, not such as by study and art he might make himself out to be."

YOUR letters have given me a new appreciation of Elaine Emans's poem, "For a Letter Box," printed elsewhere in our pages. Thank you, "Good Neighbours," one and all, for your messages of encouragement and good cheer.

Mary

IN SPITE OF THESE MEN



Speedee

JUG ELEMENTS

STILL THE PRE-WAR PRICE OF 9/6 (10/6 fitted; extra ferrules 1/- each, fitted)

Away back in 1939 . . . before Hitler, Mussolini and Hirohito started all the trouble . . . replace elements for Speedee Jugs sold for 9/6 . . . that price has never been increased despite the higher costs of labour and materials, and increased Sales Tax.

Remember, there are ample stocks of Speedee elements for Speedee Jugs. 9/6 is the approved official price (10/6 if fitted). If your dealer has no Speedee Jug Elements, communicate with us, supplying your dealer's name.

H. C. URLWIN LTD.,
Manufacturers of Speedee Electrical Appliances,
LANGDOWN STREET, WALTHAM, CHRISTCHURCH.

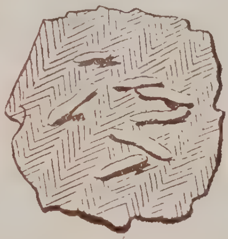
Look after your WOOLLENS— *they must last LONGER*

ALL woollens, coats, suits, dresses, underwear, blankets, rugs, etc., will last much longer if you take care of them and take advantage of the hints in this article.

MOTHS.—The first thing to remember is that it's the grub that eats your clothes, *not* the moth itself. Look out for the little eggs and the white grubs that follow.

Give all woollen clothes a regular airing. Put them on a clothes hanger and let them hang for an hour or so out of doors. Then give them a good brushing or shaking. Look particularly underneath seams, cuffs, revers and turn-ups, and in side pockets.

* * *



Never store away soiled woollen material. The dirt acts like a magnet to moths. Examine all stored woollens from time to time, giving them the airing and brushing described above.

* * *

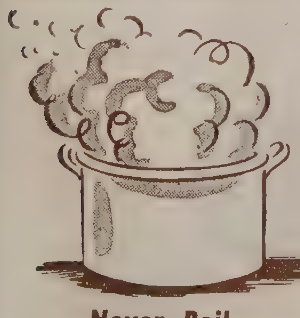
Heat will kill moth eggs, so give your clothes a good pressing from time to time. Use a damp cloth between the iron and the garments, and as you press each section, whip away the cloth, substitute a dry cloth, and re-press to dry out the dampness caused by the first pressing.

* * *

Grit and dust wear away the fibres, so brush and shake all woollen clothes often. Deal with stains at once—warm water removes **most** stains if they are treated immediately.

How to Wash Wool to Prevent Unnecessary Wear

Never Boil Woollens—they should never be subjected to extremes of heat and cold, and should not be left wet longer than is absolutely necessary.

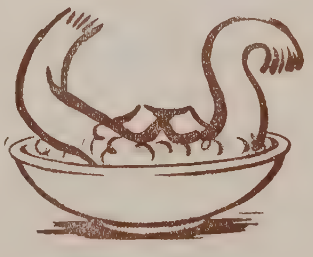


Never Boil

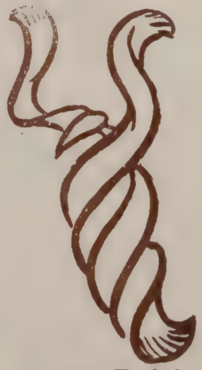
Wash quickly in a lather of soapsuds. You don't need a lot of soap if you make sure that it is all completely dissolved. Squeeze woollen garments to remove the dirt —never rub or twist.

Rinse woollens well to make sure no soap is left in them, then dry them as quickly as possible away from artificial heat.

- *Don't carry a handbag under the arm of a coat or dress.*
- *Sew a loose flap of odd material to cover the fasteners on the petersham of a skirt—otherwise the hooks catch in underclothes and tear them.*
- *Sew a narrow strip of strong material inside the legs of trousers and slacks where they rub against shoes.*



Never Soak



Never Twist

If you are washing hand-knitted garments, treat them with even greater care. NEVER WRING. After rinsing, wrap in a towel, and squeeze to allow the surplus moisture to be absorbed by the towel. Then lay flat, pull to the correct shape, and dry in this position. The ideal way to dry woollens is to lay the garment on a string hammock or on a cloth over a wire tray or on a roller towel fastened to the ends of two chairs.

IRONING

Press washing woollen fabric materials lightly on the wrong side when they are dry. Knitted clothes don't usually need pressing.

GLAMOUR · 1939

ALL YOUR GUINEAS COULDN'T BUY IT!

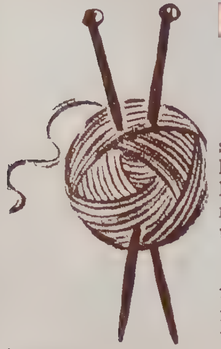
. . . and it's out of date anyway! But no doubt you sigh, remembering the comfort and skin-snug fit of that gleaming satin lastretch.

We sigh too. This pre-war Berlei is lovelier, more supple than your wartime Berlei—but only because, in the national interests, the law stipulates exactly how much elastic, and how much 'finish', we may put into a corset.

Thank you for accepting hardships in such good spirit. Do not think we have lost sight of the beauty and comfort you had come to expect in your Berlei. We have an executive in America now, investigating synthetic elastic. You shall have it soon . . . just as surely as, with peace, you shall have Berleis more glamorous than you ever dreamed.

Berlei
TRUE-TO-TYPE FOUNDATIONS

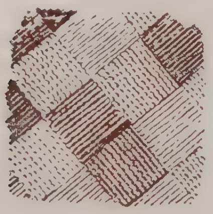
Getting the Best Wear Out of KNITTED GARMENTS



Mend and darn knitted garments as soon as they need it. If there is a large hole at the elbow of a jersey or the heel of a sock, it is easier to knit a new patch and sew it in, rather than to darn the hole.

Never waste a knitted garment, even though it may be badly shrunk or too ragged to wear. Unpick the seams and then unravel each part of the garment, beginning at the end where the knitting was finished off. This is usually at the neck of the jumper or cardigan, at the top of a sleeve, and so on.

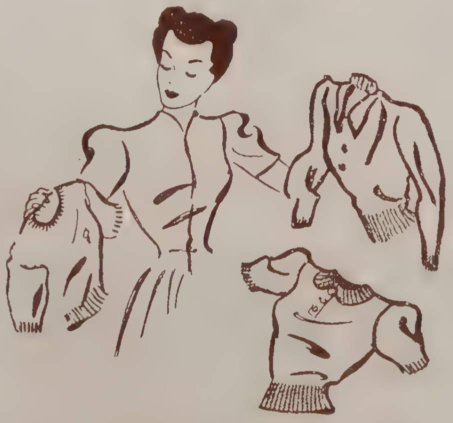
Make the unravelled wool into a skein and swish it round in some warm soapy water. It is a good idea to tie the skeins in at least four places before washing, otherwise it will tie itself into inextricable knots. Rinse well, and lay flat to dry. Then wind into balls in the ordinary way. You may have to break the wool a good many times when unravelling. Don't rejoin with knots, but wait until you knit the wool, then unravel the ends a little and roll two together.



Socks can always be refooted in another colour, and jerseys, jumpers, and cardigans look quite smart with contrasting sleeves. Don't hesitate to use dark coloured wools for children's underwear — it's out of date now to use light shades only.

Knit up odd lengths of wool into squares and join them together to make blankets, cot covers, babies' shawls.

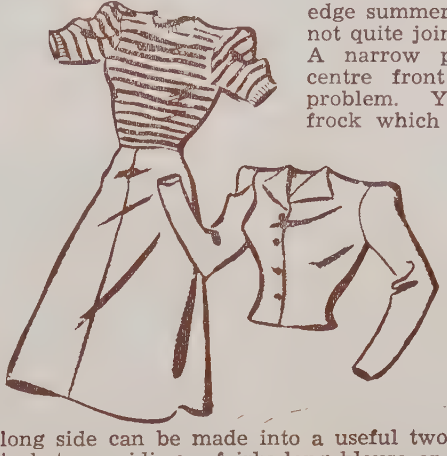
When elbows begin to wear thin in jumpers and jerseys it is a good idea to take out the sleeves and reverse them.



New garments can be knitted up from two colours of old wool. Jumpers with contrasting backs and fronts are very useful if you make the neck reversible.

ALTERATION IDEAS

With light summer coats a changeover can often be done by unpicking the facings and revers, adjusting the neckline, and seaming the coat up the centre front. The sleeves will probably need taking in a little.

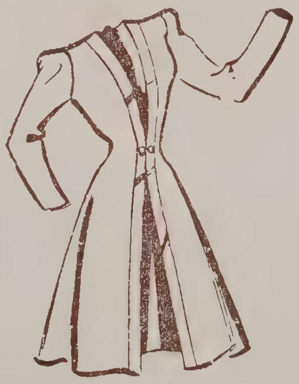


You may have an edge-to-edge summer coat which will not quite join down the front. A narrow panel down the centre front will solve the problem. You may have a frock which has become too worn to be of any use as it is, or a blouse worn under the arms. You will probably be able to get enough material out of this to make the panel.

An old coat that is on the long side can be made into a useful two-piece dress and jacket, providing a fairly long blouse or jumper is available to make a top for the dress. Cut the coat round at hip level, and remove facings from the lower part. Join up the centre front seam and sew this new skirt on to lower edge of the blouse.

Then face lower edge of jacket. The original coat must be cut to correspond with the length of the blouse used, so that the jacket and matching part of the skirt just overlap.

Even if a woollen garment is really badly worn, there is bound to be enough good material left to make a jerkin or waistcoat or even a wool blouse with a knitted yoke and sleeves made from an old unravelled knitted garment.



HINTS ON MENDING AND REINFORCING

All woollen garments should be reinforced on the inside where they get hard wear—if they are new before you start wearing them. This will make them last much longer.

Once they become threadbare or develop a tear or a hole the best way to mend them is to draw threads of the same material from a seam or hem, and darn with this. Holes can be mended invisibly by cutting a patch from the inside of a hem, as much bigger than the hole as can be managed. Fray the edges of the patch and darn these frayed ends into the material round the hole. If only a small patch can be managed, lay it underneath the hole and darn it with threads drawn from a seam.

Pockets and belts can often be used for patching and mending. Do not bother about matching the material, as it is quite fashionable these days to have patches of contrasting colours.

To refoot knitted socks pick out a stitch with a knitting needle and pull gently to form a loop, then break the thread and gradually withdraw it all along the row. This will separate the foot from the ankle portion. Then pick up the stitches and re-knit.

(Reproduced by permission of the United Kingdom Board of Trade.)

PEACE TALK

Through the chaos of war shines a hopeful future . . . a future of new promise and opportunity for young lives of to-morrow. And in the midst of war it is sometimes good to let our minds dwell on thoughts of peace . . . of the good things in life we are fighting for.

To-day, Onehunga products are out there fighting, too. They're doing their bit "over there," so please don't become impatient if you find that your retailer can't supply all the Onehunga goods you want. The Onehunga Mills are occasionally able to release limited quantities of their famous products for civilian use, so just keep on trying, and when you can buy Onehunga quality you'll realise it has been worth waiting for.

ONEHUNGA

ONEHUNGA BLANKETS —— AIR-CELL BLANKETS —— ONEHUNGA WOOLLENS & TRAVEL RUGS. Distributors: SARGOOD, SON & EWEN LTD.

"A Welcome Letter"

Of all the people with whom we come in contact day by day, down through the years, no one brings more change into our lives than our old friend the postman. In his bag he carries the joys and sorrows of the world, news of great importance, and little simple bits of home gossip. But to someone, somewhere, all these letters find a way, and it is some of the welcome ones we have shared in this competition.

First prize goes to "Eleanore" for her entry—I am sure you will all agree that her letter must have been more than welcome. And second prize to "Alix," with Mary McMartin, highly commended.

First Prize

IN the late twenties a girl of 18 said goodbye to a boy of 21, kissing him fondly as he joined a group of "Young Farmers" at Tilsbury, about to sail for Australia. I was the lonely girl who was left behind, and the letters I received from my sweetheart were awaited with eagerness. My parents, however, had always thought us both too young and untried, and when a school teacher 15 years my senior wished to marry me they thought it would be a far more suitable match. Then, after two years, the letters from Australia slackened, and finally stopped altogether. I was so wounded and unhappy that at last I consented to become engaged to my teacher-suitor on my twenty-first birthday. Yet I still listened tensely every time the postman's ring sounded, never quite losing hope, even although my letters had remained unanswered for so long.

Then one spring morning, a few weeks before my birthday, a letter arrived bearing a New Zealand stamp. Even now I remember how I felt when I saw it, and how my fingers trembled as I tore open the envelope! Walter had been ill, and had left Western Australia with a friend to try his luck in Queensland. There he worked until the depression left him without a job. Finally he had gone to New Zealand, but everything had been so hard that England seemed very remote, and marriage quite hopeless. Also he had heard from someone at home about my school teacher. But did I still want him, and would I come out to New Zealand? His father had died a short time ago, leaving him £600—a lot in depression days — and he was older and wiser now.

Did I still want him? The rest of the story is simple, for now I am the wife of a backblocks farmer. I love my home here, and never regret my choice, although sometimes my thoughts go back to the scent of hyacinths mingling with the smell of breakfast coffee, and the spring sun shining on mother's brown hair, reminding me of the welcome letter that brought so much change into my life.

—**"Eleanore."**

Second Prize:

JUST over a year ago, amidst a goodly assortment of mail, I espied an envelope with an official heading. Wonderingly I opened it, to find it contained two letters, one from our Mary recommending to me the writer of the second letter, and asking if I could assist her.

The second letter was from an unknown woman in Invercargill, written to Mary, and asking her to put her in touch with "Alix," who had mentioned a book in an essay competition that she was anxious to obtain and had tried for without success. That letter was the beginning of a quiet friendship, one of the many I am sure Mary has had the joy of setting in motion. Regularly long cheery letters have passed from one island to the other as "Alix" and "J.F." have become better acquainted with one another's aims, ideals, and interests. Seeds, plants, bulbs, patterns, etc., have been exchanged, forming yet another link in Mary's chain of friendship amongst her Good Neighbours. What joy letters can bring, and surely there must be many New Zealand homes where Mary and the pen friendships she has so lovingly linked add fresh interest and zeal to the daily round and common task.—**"Alix."**

Highly Commended:

YOU asked for the story of an unexpected letter and its effect. Here is the story, the effect will not need to be told.

The woman was a farmer's wife; she had married late and she was over 40 when her son was born. Both parents adored the boy. The farm was a small one and not over-fertile, but they worked hard to make it pay, and by the time the boy was 20 it made a living for them and there was enough put by to build a small new home in place of the old lean-to building. The lad had a sweetheart, daughter of a neighbour, and his parents hoped they would marry soon and take over the farm. The young people would have the new house and the old folks planned to stay on in the old one and draw the pension to provide their few needs.

Then war broke out. With all the fire and courage of youth the boy wanted to go, to "be in it" with his pals. His father had been through the last war and did not want his son to see another, but they could not deny him. So he went to war and his mother and father straightened their weary backs and kept on the farm so that it should be right for him when he came back. They did not discuss the possibility of his not coming back.

When the New Zealanders went to Greece on their desperate errand he was with them. And when, after those fearful nights and days, the toll was taken, he was reported "missing, believed killed." The old people seemed to shrivel and grey like a tree that has been struck by lightning, but still remains standing. They could have sold the farm and lived on the proceeds and their pensions, but they went on—like automatons wound up and unable to stop. They never mentioned the son. Then, eighteen months later, a letter came to the farm, addressed in a strange hand and bearing an Egyptian stamp. Here is the letter:—

"Dear Mrs. T.,

"You will not know me, but that is of no importance; I write to you of your son. I do not know what information the authorities have given you about him, but this is what I know.

"We were in the same unit and went to Greece together. I am 20 years his senior, but we were good pals—the best. When we began to withdraw from the Grecian hills we were still together. Then the boy was wounded, not badly, but in the leg, making travel difficult. I was forced to leave him in the care of an old shepherd and his wife. Luck was with me for a while, and then, within a day's journey from the coast, I got mine. The Germans left me for dead on the side of the road, but in the night a Greek took me into his home. He and his wife

ISSUED BY THE DEPT. OF HEALTH

SALAD DAYS are here again!

Summertime is salad-time. Sensible home-gardeners will have a supply of fresh greens coming along all through the season.

Every day you should get some raw fruit or vegetable—the fresher the better. In a salad, no food value is lost by cooking. And crisp, fresh, raw fruit or vegetable needs chewing, which keeps the teeth clean and healthy.

With lettuce as a basis (finely shredded heart of cabbage makes an excellent substitute for lettuce), make a salad of grated carrots and swedes, chopped celery, onion, beetroot, tomatoes, apples, chives, mint, parsley, radishes, and young green peas—with cheese and walnuts.

This list will give you an almost endless variety of tasty and nourishing salad dishes!

IMPORTANT: In making any salad, the vegetables or fruits should be shredded or grated or chopped and combined *just before* the meal at which it is to be eaten. In this way you get the greatest value from your salad vegetables and fruits.

Vary your salads and use them often. And get all you can out of your own garden.

7a

FOR A HEALTHIER NATION

risked their lives to nurse me. I had been hit in the head and was pretty bad for some months, then when I was able to travel the Germans had overrun the whole country, and movement of any kind was difficult. But at last I managed to get away, and now, more than a year later, I am back in Egypt. I have asked at headquarters, but there is no record of your son having reported back, so he must be still in Greece. There are many of our boys there still, well back in the hills. The Greeks will hide them and feed them, and when the time comes to drive the Germans out again they will be there in force, ready to lend a hand. So I am sure that your lad is alive and well, and with luck will come back to you when this mess is cleaned up. Before I left him he gave me a note for you, and by a miracle I have it still, it is enclosed in this letter. May it be for you a message of hope and good cheer.

"Yours sincerely,

J.F."

AND THIS IS THE NOTE:—

"Dear Mum.

A good friend will send this to you. Don't worry about me; I know I'll come through. Maybe it will take time, but I'll make it in the end. Tell Dad I remember all he told me. And tell Betty I expect her to wait for me. Keep your chins up.

"Love to you all,

"B."

—Mary McMartin.

Competitions

DECEMBER

Make your "Resolutions for the New Year" a little earlier than usual and let me have your list by December 15.

JANUARY

What do you consider the twelve most beautiful things? Do you turn to the loveliness which man himself has created in music and poetry, painting and sculpture, in order to satisfy your aesthetic tastes, or do you prefer the fair gifts of Nature—trees and clouds and quiet hills, moon-silvered water rippling over stones? Think carefully before setting down each item, for your choice must not exceed "TWELVE BEAUTIFUL THINGS."

The competition closes on January 15. The first prize is 10/- and the second 5/-.

"MARY,"
C/o "Journal of Agriculture,"
P.O. Box 3004, Wellington.

Kimihia te Matauranga—"Seek Knowledge"

Correspondence School

A TALL white building set upon a hillside; wide, many-windowed rooms where teachers sit busily marking papers; a pervading air of quiet diligence such as befits a place of learning—but neither sight nor sound of a child, for this school has the unique distinction of teaching every one of its 4,000 pupils by correspondence.

THIS method of education was inaugurated specially for those living in country places too remote for them to go to school, or where there are no facilities for post-primary instruction, or conditions of employment render attendance at evening classes impracticable.

A large quantity of mail from all over the Dominion is delivered at the School daily.

Fully 90 per cent. of the students are farmers' children, many of whom would otherwise be denied the scholastic and cultural facilities which should be the natural heritage of every child. Another point worthy of praise is the extension of these services to those who are pecluded from school attendance because of physical disabilities or ill health, and the number of handicapped youngsters being helped in this way now totals 400.

There are no restrictions regarding the age of pupils: they range up the scale from the Primer I beginner having his first lessons in word-building, counting, and drawing, to an 86-year-old grandmother who is studying the subject of farm accounts so that she can keep books correctly! How true are Garfield's words: "Next in importance to freedom and justice is **popular education**, without which neither freedom nor justice can be permanently **maintained.**"

Parents have a particular responsibility in the matter of providing suitable conditions for study and seeing that a regular time-table is adhered to in order that the work will be ready for mailing at the end of each fortnight. A tribute is due to the mothers, especially those who help with the cows, look after poultry and other livestock, do all the cooking, sewing and housework, and yet still find time and energy to assist their children by supervising their lessons. To make things easier for the mother where there are three or four members of a family enrolled with the school one teacher is appointed to take the entire group even though their ages—and corresponding mental development—may vary considerably, which is not all plain sailing as far as the teacher is concerned.

The written lessons are supplemented by bi-weekly broadcasts when instruction is given in a wide variety of subjects. The programme for the month may include such topics as conversational French, European folk songs, musical games for infants, English verse and Arctic exploration, and talks on the U.S.A., transport problems, and killer whales. Adults enjoy listening-in to these sessions, too, but few of us realise the amount of time and thought which goes into their preparation. All the programmes are worked out by the staff officer in charge so as to make the best possible use of every minute of the two half-hour broadcasts each week.

Glancing through a pile of exercises which had just come in I had ample opportunity to observe the general neatness and orderly setting out of the assignments. The legibility of the handwriting was such that "he who runs may read," the diagrams being clearly drawn and in some cases coloured with paints or crayons. Corrections are made by the teacher in green or red ink and the model answers go back with every set of lessons. Those at which I had been looking formed a portion of a series of agricultural courses in which the school specialises. I spent a considerable time in this department where apparatus consisting of test tubes, thermometers, measuring cylinders, chemicals, etc., is

Text books, stationery, crayons, paints, and science equipment are issued from the School's large store.

packed in wooden cases and forwarded to students, who are thus enabled to carry out the necessary experiments in conjunction with their studies. Microscopes are also sent when needed—how wonderful to view the down from a butterfly's wing or the cross sections of seeds or flowers through that powerful "eye." The recipients also attain a high degree of proficiency in the use of a screwdriver, since no fewer than ten screws must be manipulated before opening the larger boxes, and these must be duly replaced and tightened when preparing the equipment for return post! Thanks to the co-operation of the high schools arrangements have been made whereby science students, after completing eighteen months' to two years' work, can enter the nearest secondary school for a week's intensive training in the laboratory. If it is not possible to secure accommodation at a hostel, parents of resident pupils will often board the visitor so that the requirement of twenty-five hours' practical work before qualifying can be met.

The exceeding popularity of needlecraft and kindred arts can be gauged by the fact that there are 1,300 students taking this subject in its various forms. I watched a teacher embroidering a new stitch upon a square of canvas; another was scrutinising a garment in the process of making. Every detail in dressmaking, from the first drafting of the pattern to the last stages of finishing, is submitted for the instructor's approval before continuing with the next step. Hand-woven scarves, knitted jerseys and sox were also on display, and bales and bales of warm clothing have been made by the children and despatched overseas for distribution among the children in the bombed areas of Britain. I was greatly interested in the samples of dyes obtained from New Zealand plants, the native kawakawa and koromiko (veronica) proving very useful in this respect; and I admired the unusual tonings of green and russet, yellow and clover. In the adjoining showcase were picture designs in appliqued felt and a beautiful cream rug with an original border pattern, the latter article resulting from the concerted efforts of a single family, one of the boys even having built the wheel on which the wool was spun.

Prowess in woodcraft was demonstrated by sets of building blocks; a useful stool and tray; intricately constructed bi-planes; a monkey which performed amûsing antics on a stick; and really delightful collections of miniature farm animals grouped against a rural background of trees and barns. The achievements in arts and crafts as well as in the routine schoolwork have been such that two exhibitions were sent on circuit, one in the North Island and the other in the South. I remember seeing this exhibit when it was shown in Wellington. It attracted such a continual stream of visitors that I had to wait my turn for a vantage point from which to see the display.

A tour of the capacious storeroom revealed further evidence of the extent and variety of the courses offered by the school. The walls were lined with a multitude of text-books in a remarkably good state of preservation, despite frequent usage. Here were supplies of ink, pencils, and stationery (for the replenishing of these necessities would otherwise present rather a problem to countryfolk living so far away from any shops). Other shelves held mathematical instruments, plasticine, paint in tubes, bundles of brightly coloured raffia, and looms for weaving. A narrow flight of steps led to another room which housed bolts of flowered materials, reels of sewing cottons, a veritable rainbow of wools, saws and chisels, wooden breadboards and book-ends for embossing with pewter or brass, suede skins in gay shades, glass funnels, graduated beakers, and tiny spirit lamps which reminded me of the fabled lamp in the Aladdin story.

AT NIGHT

Home, home from the horizon far and clear,
Hither the soft wings sweep;
Flocks of the memories of the day draw near
The dovecote doors of sleep.

Oh, which are they that come through sweetest light
Of all these homing birds?
Which with the straightest and the swiftest flight?
YOUR WORDS TO ME, YOUR WORDS!

—Alice Meynell.

I next visited the library where readers may choose from 12,000 volumes ranging from fairy-tales for little tots to the greatest works of literature. Another interesting department dealt with the mimeographing of lesson material, and the stencils, etc., in this connection constituted quite a library in themselves. Students' assignments are posted in large, durable two-way envelopes, so-called because they are inscribed with the address of both school and pupil and have a device for covering the address not in use. The well-filled bags by the door of the postal section contained only a small part of the mail handled daily. Indeed, the excellent clerical organisation has contributed much to the efficiency of the school. Picture for yourselves the magnitude of the filing system which has dealt expeditiously with over 30,000 enrolments in the past 21 years.

Among the numerous photographs of pupils adorning the corridors are two maps autographed by the children who attended vacation schools, the first one being held at New Plymouth and the second at Oamaru. The scheme proved so successful that it is hoped to hold these schools regularly. Another fine piece of service is the provision of itinerant teachers who visit the pupils in their own homes. The following instance will give you some idea of the immensity of their task. There are 300 names on the roll in one northern district and in order to establish personal contact with these children the teacher travelled 334 miles by train, 361 miles by bus or mail-van, 629 miles by lorry or school-bus, 7 miles by boat, 102 miles on a borrowed bicycle, and 98 miles by walking. He also slept in 52 different beds!

In addition to their academic duties the teaching staff undertake extra-mural activities such as Guides, Scouts, S.P.C.A., Junior Red Cross, Garden Circle, Meccano, Stamp Exchange, Camera, International Pen-friendship, and Field Naturalists' Clubs. Members of the last-named club are the donors of the fascinating specimens in the school museum—amethyst quartz; Maori weapons; moa bones; shark teeth; cowrie shells from Rarotonga; birds' nests and eggs and plumage; a tuatara lizard from Stephens' Island; pearl shell from the Cook Islands; a hat made from pandanus palm; an early edition of the "Lyttelton Times," and a host of other unusual curios. A school magazine is published annually under the appropriate title of "The Postman," the photography being a distinctly commendable feature, also the black and white drawings decorating the pages allotted to the efforts of the infant division. Budding authors are invited to contribute to "The Story-writers' and Playwriters' Magazine" as well, while ex-pupils have a "Budget" of their own which includes news of members now abroad.

Thus it is readily seen that the Correspondence School not only offers a means of education in the widest sense of the term, but has opened up avenues of vocational activity formerly not available to children living in isolated districts. Special attention is given to the individual needs of each pupil, according well with the principle outlined by Ruskin: "The training which makes men happiest in themselves also makes them most serviceable to others." The resultant benefit to the Dominion from this "branch of the great national service conducted by the Department of Education" is inestimable.

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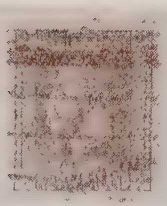
The Art of Letter-Writing



In our grandmothers' time letter-writing was considered as part of a young lady's accomplishments, ranking in the same category as fine needlework, flower arrangement, piano playing, and other forms of artistic effort. Indeed, such was their facility with the pen that they invariably kept diaries as well, and sometimes essayed special records of such exciting functions as picnics and cycling expeditions to popular beauty spots.

I PERUSED one of these old chronicles recently which dealt with an outing in the summer of 1890 for the purposes of adding to a collection of native plants which its owner had pressed and mounted in true botanical fashion. There was a lengthy description of the trip to the bush and the day's incidents were detailed minutely, the really beautiful penmanship being further embellished by tiny water-colour sketches of fellow-botanists, flora, and scenery!

The advent of cars, radio, and other mechanical devices, however, and the resultant speeding up of life generally, have had their effect on human habits, and over a period of years the majority of people have gradually experienced less and less inclination to devote their spare time to leisurely discourse in epistolary form. It is now customary to ring up Jack or Josephine to enquire after their welfare and indulge in a mutual exchange of news, or if your friends are not on the telephone, to dash off a brief note. Entertaining has become much more informal than it used to be: parties are arranged and invitations issued—and accepted—per medium of the telephone, although this has not done away with the necessity for the services of shorthand-typists. They still present for signature their daily sheaf of efficient-looking documents, beginning, "Dear Sir, re your enquiry of 5th ult." and etc., or words to that effect.

The war is largely responsible for the wholesale revival of personal correspondence. Letters form our main link with our kith and kin overseas, and as we read of their quiet heroism in the face of danger, their courageous acceptance of hardship and hazards, we are ashamed of our own grumbling over what are, after all, only minor difficulties.

"Mere common ink and paper are possessed of poignant arts
To speed our thoughts, like pigeons, home towards a distant shore,
And loose . . . . the secrets of our hearts."

The march of world events in the last few years has jolted us out of our complacency and imbued us with a deeper concern for the welfare of our kindred than we have ever felt before.

There is scarcely a household in this country which has not some member or relative in the forces, and the arrival of those envelopes bearing the censor's stamp and the red line of lettering, "On Active Service," is an event of major importance. Under the impetus of battle and travel in far places many a youth, previously inarticulate, has developed an unsuspected flair for descriptive narrative. I have read accounts of hairbreadth escapes that would grace the pen of a master of adventure fiction, and as for their ability to portray in simple, vivid prose their impressions of the foreign scene—the compilers of guide books might well take lessons.

Some of us may regard our ordinary round of duties as so humdrum in comparison as to be hardly worth the telling. Yet it is the little everyday things of life that our boys long so much to hear of in our letters:—

"We fight against the shame of tears, for we can see once more
Stencilled on the golden clouds the darkling roofs . . . .
We reach a well-known gate, and there stand Mum and Dad
To tell us how the pear-tree thrives and how the lilac seems.
We hear of friends, of neighbours, of the kittens Tabby had,
We tread again the paths we seek so often in our dreams . . .
When twilight drains away . . . and lamps are lit,
Whatever homely thing has chanced throughout your busy day—
In mercy's name, sit down awhile, and send us word of it!"

The whole art of letter-writing is to write as you would talk. An easy conversational style is invaluable when you are translating your thoughts to paper and does away with irksome, stilted phraseology which you would never use when chatting to a person, anyway. If your ideas are inclined to dry up before you have an opportunity to get out your writing materials, why not try making notes as you go along? Keep a pad and pencil handy in the kitchen and jot down the various items of interest as they occur. A few concise headings will probably be all that's necessary to jog your memory when you sit down to write later on. Don't forget to mention the book you have just read or the film you enjoyed; describe the family occupations and any improvements you have made to the house; share news of friends and favourite pets and hobbies—and above all, **keep your letters cheerful!** Mail from home can do so much towards preserving the morale of our fighting men at the highest possible pitch. These lines by Josephine Doyle will wake an echo in the heart of many a woman:—

"I hunt for brightest colours to trim these sober days,
And try to weave their rainbow threads across our homespun ways.
I quilt each little home-town joke with all I have of wile,
Then mail the patchwork with a kiss and hope it gets a smile.
The fabric of a letter can stretch so very wide;
It swings a hammock, maybe, where boyish dreams can hide.
Then it spreads a shelter tent of love and understanding,
Or floats a sturdy parachute where hopes can find a landing."

While we still have a pen in our hand let us remember some of the friends with whom we have lost touch since they moved to distant parts. And write those other letters of appreciation, of sympathy, or congratulation, **now**, while the impulse is strong within you. We are not always aware when the receipt of such a communication may mean all the difference between hope and despair, resolution and uncertainty. Yours may be the missive restoring lost confidence—it may prove the stimulus to renewed endeavour and achievement. Who knows!

◆

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A Communication From Canada

MAY I join your "At Home?" I enjoy reading your pages very much. I travel quite often in my mind to New Zealand—it is too bad you live such a distance away. I have entertained one of your Air Force boys at our house and my son has had dinner at his home in New Zealand. I am enclosing a poem which some of you may like. It is called the "Singing Kettle," by Whilhelmina Stitch.

"Up to the neck in water, boiling water, too,
Yet the kettle keeps on singing—that's what we ought to do.
Next time we're in some trouble, almost up to the chin,
We'll think of the cheerful kettle, and a little song begin.
It helps when feelings are boiling to let off lots of steam.
Whistle and sing with courage—things aren't as bad as they seem.
Kettle, you merry creature, scorched by the callous fire,
Teach us your power of moulding the will to the day's desire.
Up to your neck in troubles, they haven't swept over your head.
Sing like the steaming kettle till all your troubles have fled;
Singing will sound so pleasant to any who chance to hear.
The kettle does naught but its duty—but doesn't its singing cheer!"

—From Mrs. F. Griesbach, Ontario.

◆

Pleasant Tasks

Wet days are such a blessing!
They give us time to bake
And stock our empty tins again
And make a special cake.

To tidy drawers and cupboards,
And do some turning out,
And look for all the things we've lost,
And change our rooms about.

To settle to our sewing,
A treat that's really rare,
And write to long neglected friends—
There's seldom time to spare.

So much that's pleasant happens,
So many jobs get done,
When wet days don't come every day
They're really rather fun!

—C. E. Bradley.

Lines for a Letter Box

So curious a medley have I plucked
From you: so much of pleasure . . . . tucked
Within your depths a cause to hope again;
So much of beauty have you given out
Into my eager hand, and laughter—yes,
And singing, too, I seriously doubt
You dream the influence you possess.
I question if you know the chaff from wheat,
The strange new writings from the loved and old,
The bitter from the beautiful and sweet,
But never try to sort them. Only hold,
Always, as you have held, a strange, complete
Record of living from its dross and gold.

—Elaine Emans.

◆

A Letter From Home

The river is a thousand miles long;
This letter took fifteen days to come.
And after all that, it simply says,
"Do, please, hurry home."

—Yuan K'ai.

◆

Message

Build a little fence of trust
Around to-day,
Fill the space with loving work
And therein stay;
Look not through the sheltering bars
Upon to-morrow:
God will help thee bear what comes,
Of joy or sorrow.

◆

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Mental Health and Sleep

There can be no happiness without health.

THAT'S a truism that has been expressed in a dozen different ways, but the pursuit of happiness through health isn't taken as seriously as it might be. Too many people take the line of least resistance—a natural human failing, no doubt—when with a little bit of self-discipline they could get just as much fun out of life while paying proper attention to healthful living.

What is health? It's not easy to give it a name. But it has been negatively defined as freedom from the 2000 or so diseases which are enumerated in nomenclature of disease issued by the Royal College of Physicians, and to which the human body is heir. We may take it, however, that health is a state which enables a person to enjoy the soundness of both mind and body.

Healthy Brain Essential

Let's consider the mind. In less enlightened times the mind was regarded purely as the province of the philosopher and the theologian. But today we look on the mind as necessarily and intimately related to the brain—the brain, in fact, being described as the organ of the mind. There can, therefore, be no healthy mind without a healthy brain.

The brain is made up of innumerable cells called neurons, of which, it is estimated, there are 9000 millions in an average brain. These cells depend on a proper supply of oxygen, which is conveyed to them by the blood. And it is obvious that if the best work is expected of them, the blood conveying the oxygen to them must be both pure in quality and ample in quantity. This oxygen is obtained from the air, and good health must thus depend on an adequate supply of pure air.

Rest and Nature's Rhythm

As you know, the blood is carried to every part of the body by means of the heart, which beats about 96,000 times every 24 hours, and every hour, it is calculated, distributes some 250lb. of blood. Now between every beat of the heart there's a rest, as there is also between every act of breathing. These periods of rest constitute what might be termed the sleep of the heart and the lungs—a sleep that is necessary for their proper functioning.

Contributed by
The Department of Health

Similarly with the process of digestion—and similarly, too, for all mental functions. There must be adequate rest, adequate respite from normal activity. Rest and exercise, whether of mind or body, must alternate like day and night, thus maintaining that rhythm which is so innate in nature. And when the body is at rest, this is a convenient time for the mind to be at rest. This is the time of sleep, that period of complete repose which is so essential to health and happiness.

Sleep is more necessary than food. Men have fasted for weeks, but loss of sleep, for even a few days, has had ill results. It's recorded of three boys that they decided they would try to remain awake for a week. One was disabled after four days, another after five, and the third died on the seventh day.

Loss of sleep is followed by hallucinations, delirium, loss of memory, drowsiness, and finally a complete mental breakdown.

Sleep Requirements

Here, then, are some points to remember about sleep; sleep is deepest within two hours of dropping off—for those who retire at a normal hour the best sleep is that enjoyed two hours before midnight; eight hours' sleep is regarded as necessary for the average adult; children of 10 require at least 11 hours, children of five 12 hours, and babies up to 22 hours a day.

If you're living a healthy life, your sleep will come naturally. If it doesn't come naturally then there's something wrong, and it's time you took stock of yourself. A healthy body helps to make a healthy mind, and both are within reach of the normal individual.

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◆

INVITATION

No great things can I give: a friendly chair,
A quiet hearth it is my joy to share,
Plain food, but served with love and all my skill,
Another view beyond your window-sill.
A change of face, someone to pour your tea,
Warm interest in your news, glee with your glee
And grief to share your grief, and one more head
To sort your problems out and see them sped.
If such can set a blessing on your stay,
Then come, my friend, the very soonest day.

◆

The post is the grand connecting link of all transactions, of all negotiations. Those who are absent by its means become present; it is the consolation of life.—Voltaire.

ONLY NOW—ONLY IN PHOSPHATE BAKING POWDERS

a valuable food as well as a rising agent!

Before the war, N.Z. baking powders were solely "rising" agents. In Britain and America, however, these old type baking powders had already been superseded by the new phosphate baking powders. The reason was simple and sensible.

FOR BETTER HEALTH. Phosphate baking powders add phosphate to the food. Phosphate is vitally necessary for strong bones and teeth, and nervous and physical tone. It is especially important in the diet of growing children. N.Z. soils, and therefore many foods, are deficient in phosphates. So the change to phosphate baking powders in this country is immensely important. Cooking enriched with phosphate baking powder is going to mean better health.

FOR BETTER COOKING. Home science experts and cookery demonstrators throughout the country were asked to test the new perfected phosphate baking powders as made by New Zealand manufacturers. Their reports were glowing tributes to the improvement and worth of these new baking powders. Many said they would never return to pre-war baking powders even if they did come back.

All the reputable present day baking powders are made from pure food phosphate so you can buy your usual brand, knowing that it will aerate better, keep the goods fresher and do you more good. But in addition, if you have to leave the baking for an hour after adding the baking powder, no harm will result. Just work it gently again and pop it into the oven and it will rise beautifully.

Pure Food Phosphate for baking powder manufacture is a product of Albright & Wilson, and is distributed in New Zealand by Imperial Chemical Industries (N.Z.) Ltd., 16 The Terrace, Wellington.

The Problem of Puddings

A RAW apple or a handful of nuts makes an excellent close to a meal, but most families do not relish such items in lieu of puddings. Few men consider a dinner complete without a sweet and one of the refrains most often heard from the housewife is: "Whatever can I have for a pudding to-day?"

Well, if you are tired of all your usual recipes, why not try some new ones? The magazines and cookery books are full of them, and it is really great fun adding to your store of culinary lore. Sometimes you can ring the changes on an old favourite—the topping for Apple Crumb (1½ tablespoons butter rubbed into 1 cup wheatmeal and 1½ tablespoons sugar till the mixture is crumbly) tastes equally well when baked over gooseberries, red currants, or blackberries. And egg whites whipped stiff and folded in before serving will add glamour to a boiled custard, and preserved pears are twice as tempting if you drop a little vanilla essence in the syrup and bake instead of stew them. Essence of almonds is good with stone fruits, too, especially plums and peaches, and if you want a really super accompaniment make a double quantity of marshmallow filling and, instead of using it on top of a cake, pour it into a shallow oblong dish and when set cut it into squares to go with the fruit.

There are several points to be considered when deciding on a pudding:—(1) Seasonal ingredients (it is advisable to make the fullest possible use of the various fruits as they become plentiful); (2) the weather (on a bitter day a hot steamed pudding is much more attractive than a jellied compote); and (3) the nature of the main dish preceding (pie or shortcake follows a salad course well, for instance, whereas after a big roast dinner something light, like stewed fruit and junket, is sufficient). You will find the following recipes of assistance in solving your pudding problems.

LEMON SNOW.

2 tablespoons cornflour, 1 pint water, 2 tablespoons sugar, 2 lemons, whites of 2 eggs.

Grate the rind of the lemons, and add, with the juice, to the water. Then stir in the sugar and cornflour which have previously been blended with a little water. Continue stirring until the mixture thickens. Then remove from the heat, beat the egg whites stiff, and fold them in. When cold pile the pudding roughly in a glass dish. Serve with a custard made with the egg yolks.

PRUNE WHIP.

2 dessertspoons gelatine, 2 cups milk, 2 eggs, 1 cup stewed prunes, 1 tablespoon sugar, 1 teaspoon vanilla essence, ½ cup water.

Separate the yolks and whites of the eggs. Beat the yolks, add to the milk, essence and sugar, and cook in a double saucepan. Dissolve the gelatine in ½ cup boiling water, and add to the mixture. Stone the stewed prunes and cut into pieces. Beat the whites of eggs stiffly and fold in, then add the prunes. Pour into a wet mould to set.

COFFEE CREAM.

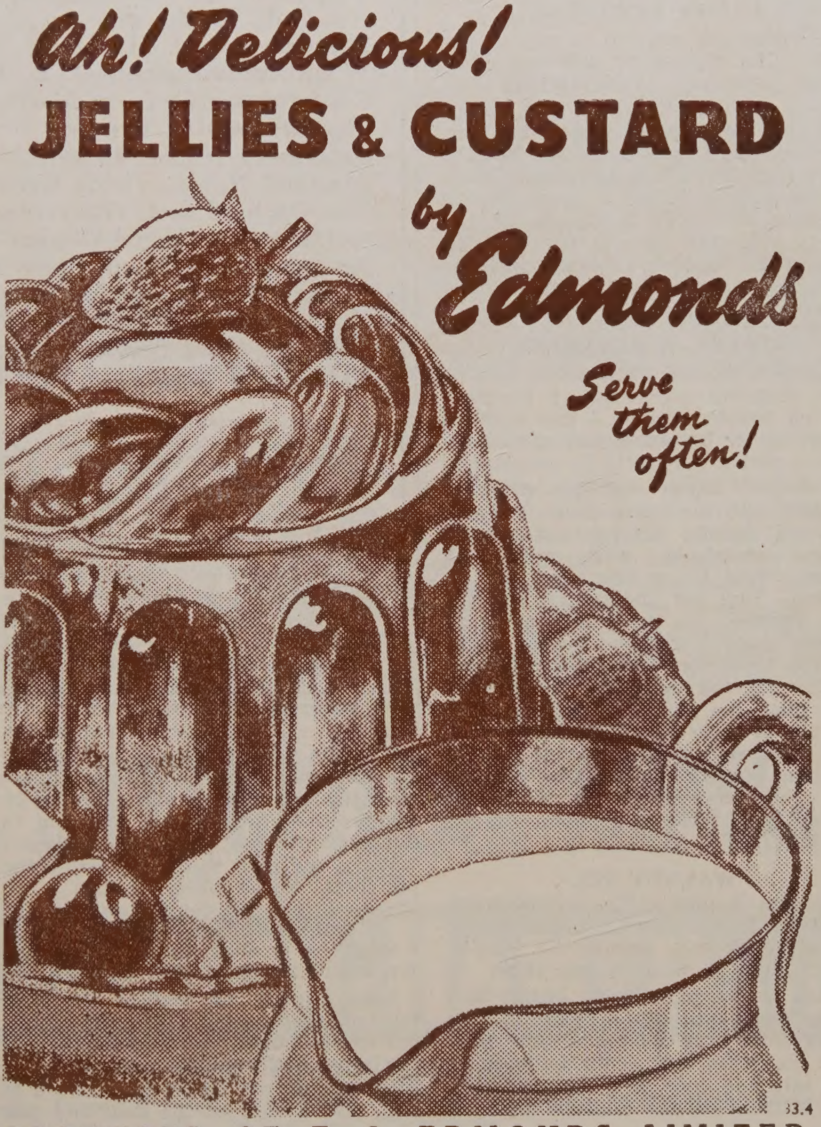
1 pint milk, 4 tablespoons strong coffee, 4 dessertspoons sugar, 2 dessertspoons gelatine.

Heat the milk, add the coffee, also the gelatine which has been dissolved in a small quantity of boiling water. Pour into a basin and leave in a cool place. When the mixture begins to thicken whip with a rotary beater till moderately stiff, then add the sugar and whip till very stiff. Turn into individual glasses to set and serve with chopped nuts or grated chocolate on top.

MINT PEARS.

1 packet lime jelly crystals, ¼ cup chopped mint, 6 stewed pears.

Make the lime jelly according to the directions on the packet. Just before



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it thickens add ¼ cup of finely-chopped fresh mint. Pour the mint jelly over the stewed pears, which have been arranged in a shallow glass dish. Make sure each pear is thoroughly coated with the jelly and leave to set.

BREAD PUDDING MERINGUE.

2 eggs, 2 cups bread cubes, 7 tablespoons sugar, 1 pint milk, vanilla essence, ¾ cup jam.

Heat the milk and add 3 tablespoons of sugar and the essence of vanilla. Leave to cool before adding the yolks of the eggs. Butter a piedish, place the bread cubes in it, and pour the milk and egg mixture over them. Bake in a moderate oven 25 minutes. Remove from the oven and spread the jam over the pudding. Beat the egg whites stiff and add the remaining 4 tablespoons sugar. Pile the meringue on top of the pudding and bake at a low temperature for 20 minutes.

RAISIN FRITTERS.

4 tablespoons oatmeal, 1 egg, ½ cup milk, ¼lb. raisins or sultanas, 2oz. sugar, pinch salt, fat for frying.

Beat the milk, oatmeal, salt, sugar, and egg together till light, and then leave to stand for 1 hour. If too stiff after standing, add a little more milk before stirring in the chopped raisins or sultanas. Drop spoonfuls of the mixture in hot fat and fry on both sides till a golden brown. Sprinkle with brown sugar and lemon juice before serving.

APPLES IN BLANKETS.

1 cup flour, 3oz. butter, 2oz. lard or beef dripping, pinch salt, ½ teaspoon baking powder, apples, 1 cup sugar, 2 cups water, brown sugar, cinnamon, lemon peel.

Rub 2oz. butter and 2oz. dripping or lard into the sifted flour, add the salt and baking powder and mix to scone consistency with milk and water. Peel the apples and cut in halves. Roll out the pastry and cut into squares. In the centre of each square place 1 teaspoon brown sugar, a little cinnamon, and chopped lemon peel. Put the apple on top of this and wrap the pastry round it. Place the cup of sugar in a baking dish, pour the water over, and dot with the remaining ounce of butter, then arrange the apple pastries in this syrup and bake in a moderate oven 35—45 minutes.

WALNUT PIE.

2 eggs, ½ pint milk, 1 tablespoon gelatine, ¼ cup water, ¼ cup brown sugar, pinch salt, essence of vanilla, ½ cup chopped walnuts, pie shell.

Line a pie plate with pastry and bake. Leave to cool. Separate the yolks from the whites of the eggs, beat the yolks, add to the milk, sugar and salt, and cook in a double saucepan, stirring till the mixture thickens. Dissolve the gelatine in hot water, stir in the vanilla essence, and add to the custard. When it starts to set beat the egg whites stiff, gradually fold in the brown sugar, and add to the custard. Lastly add the chopped walnuts and pour the mixture into the pie shell. Serve when set firm.

COCONUT TART.

6oz. short or flaky pastry, 1oz. butter, 3oz. sugar, 2 eggs, 1 cup coconut, jam.

Line a plate or shallow tin with the uncooked pastry. Melt the butter, stir in the sugar, and add the beaten egg yolks. Cook this together for a little, but do not allow the mixture to boil. Remove from the heat and add the coconut. Spread the pastry with jam, pour in the coconut mixture, and bake about 30 minutes in a moderate oven. Beat the egg whites and pile on top of the tart. Return to a cool oven and cook another 15 minutes.

GOLDEN SPONGE.

1 tablespoon butter, 2 tablespoons sugar, 1 cup flour, 3 tablespoons milk, 1 egg, 3 tablespoons golden syrup.

Cream the butter and sugar, add the sifted dry ingredients, and lastly the beaten egg and milk. Beat well till the mixture has a silky texture. Grease a basin, add the golden syrup and then the sponge pudding. Steam 1½ hours.

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SUBSCRIPTION RATES.

The *Journal* is issued monthly. The subscription within New Zealand, which is payable in advance and includes postage, is 2s. 6d. a year. The overseas subscription is 5s. Subscriptions should be forwarded or paid direct to any office of the Department of Agriculture in the Dominion. Single copies, price 6d., are available from the Department of Agriculture, Box 3004, Wellington.

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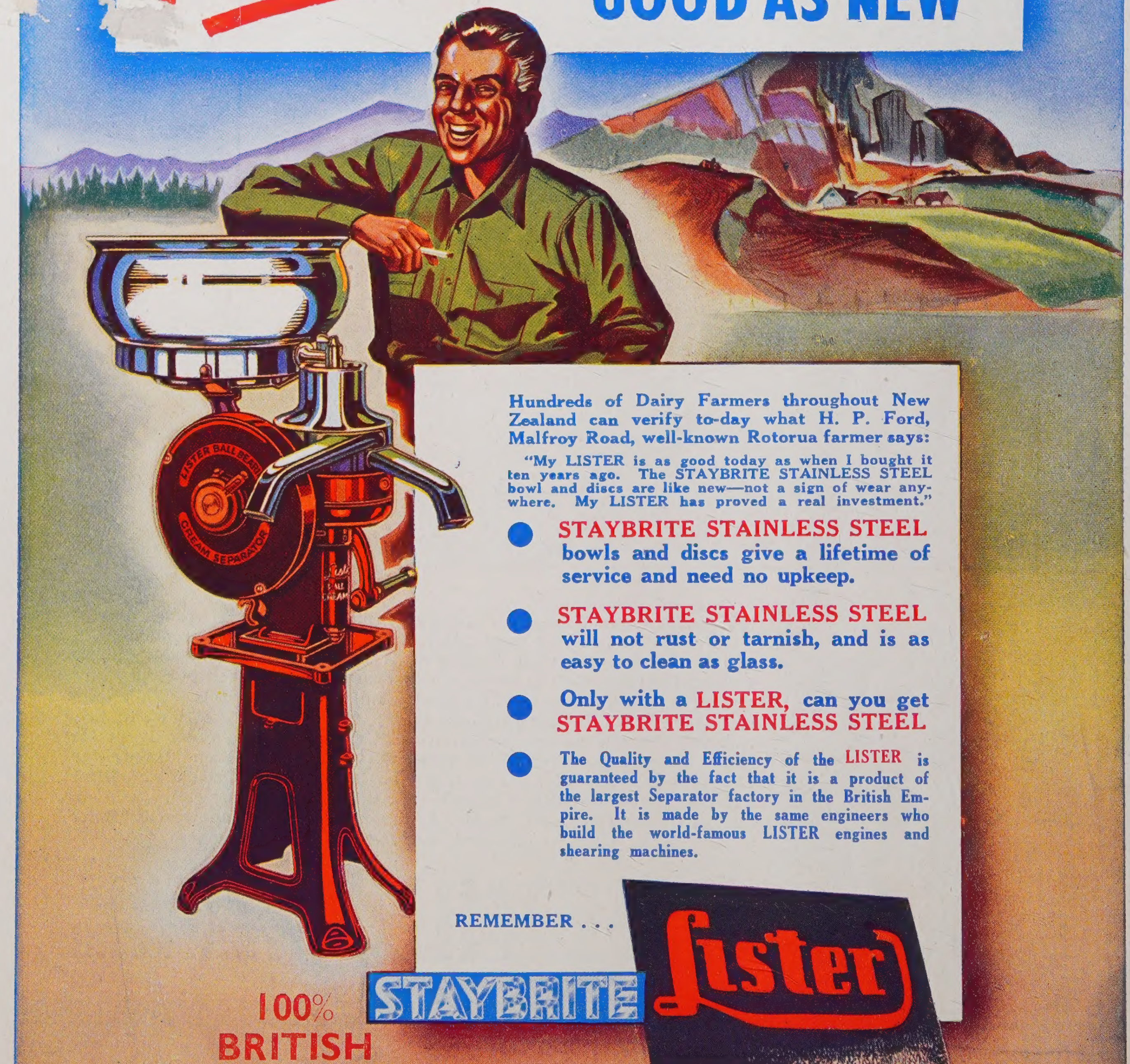

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